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Flaming Gorge
Ranger District

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Linwood-South Valley Allotment

Environmental Assessment

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**Linwood-South Valley Allotment
Environmental Assessment**

**Ashley National Forest
Daggett County, Utah**

Lead Agency: U.S. Department of Agriculture, Forest Service

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SUMMARY:

The Ashley National Forest proposes to continue cattle grazing on the Linwood-South Valley Allotment. The project area is located on the Flaming Gorge Ranger District in Daggett County, Utah, approximately four miles east of Manila, Utah. The allotment is located entirely within the Flaming Gorge National Recreation Area and lies adjacent to Flaming Gorge Reservoir. The Ashley National Forest Land and Resource Management Plan (Forest Plan 1986) determined that this allotment is suitable for livestock grazing and that there is a continuing need for forage production. The proposed action is intended to continue this historic use, but also recognizes the need to improve wildlife habitats, recreational values, and vegetation resource conditions on portions of the allotment.

The proposed action (Alternative 3) changes cattle numbers, season of use, and areas grazed on the Linwood Unit while maintaining current management of cattle grazing on the South Valley Unit.

In addition to the proposed action, Alternative 3, the Forest Service also evaluated the following alternatives:

- Alternative 1 – Maintain Current Grazing (No Action)
- Alternative 2 – No Grazing
- Alternative 4 – Change grazing in the South Valley Unit from fall/winter to spring/summer to maximize browse production, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit

Based upon the effects of the alternatives, the responsible official will decide whether the proposed action would proceed as proposed, as modified by an alternative, or not at all. If it proceeds, the responsible official will answer the following questions:

- What mitigation measures and monitoring requirements will be required?

Send Comments to: Flaming Gorge District Ranger
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CHAPTER 1 – PURPOSE AND NEED

A. DOCUMENT STRUCTURE

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four Chapters:

- *Purpose and Need:* Chapter 1 includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This chapter also details how the Forest Service informed the public of the proposal and how the public responded.
- *Alternatives:* Chapter 2 provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on key issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this chapter provides a summary table of the environmental consequences associated with each alternative.
- *Environmental Consequences:* Chapter 3 describes the environmental effects of implementing the proposed action and other alternatives. The analyses are organized by resource area. Within each section, the affected environment is described first, followed by the effects of each alternative.
- *Consultation and Coordination:* Chapter 4 provides a list of those who prepared the document and agencies consulted during the development of the environmental assessment.
- *Appendices:* The appendices provide more information to support the analyses presented in this Environmental Assessment. The appendices also include a list of references and maps.

Additional documentation, including more detailed analyses of project area resources, may be found in the project planning record located at the Flaming Gorge Ranger District Office in Manila, Utah.

B. BACKGROUND

Project Location – The Linwood-South Valley Allotment is located on the Flaming Gorge Ranger District of the Ashley National Forest in Daggett County, Utah. The allotment is located entirely within the Flaming Gorge National Recreation Area (NRA) and lies adjacent to Flaming Gorge Reservoir (refer to Maps 1 and 2 in Appendix A). The northern boundary is near the terminus of Linwood Bay on Flaming Gorge Reservoir, approximately four miles east of Manila, Utah. The allotment follows the Reservoir at varying degrees inland to its southernmost point near Sheep Creek Bay approximately five miles south of Manila, Utah. The allotment's interface with the Reservoir varies from flat, sandy beaches to sheer, rocky cliffs.

History of Allotment

- **1960s** – The Linwood Unit was acquired from private land owners during the creation of the Flaming Gorge National Recreation Area (FGNRA).
- **1970** – The Forest Service acquired the South Valley parcel of land from the Bureau of Land Management (BLM), took over the BLM permit, and began managing the South Valley Allotment. At this time, the Forest Service requested the permittee apply for the permit. However, rather than delaying the permit, the Forest Service reissued the old BLM permit for the South Valley area until the application process was completed. The permit was issued and dates for spring use were set from May 1 to June 15 with a fall date of September 1 to September 15 (not to exceed 215 sheep months use for both spring and fall which equaled 1,500 head). The permittee proposed to have the use date moved to October. This proposal was denied, due to this area being critical deer winter range, and sheep would make more use of the browse in the late fall (see project record letter dated May 1, 1970). In 1970, several transfers of livestock or property were attempted with this permittee. Due to lack of completion of appropriate applications, one cow and nine horse permits were held in non-use status during 1970 and 1971.
- **1971** – As part of a larger permit, a grazing permit for 1,500 sheep for the South Valley Allotment was issued. The dates were set from May 1 to June 15 and September 1 to September 15, with total use not to exceed 450 sheep months annually. In fall of 1971, a request was made by the permittee to convert from sheep to cattle, and a conversion ratio of 1:5 was used.
- In the **spring of 1972**, the permittee acquired a temporary permit for the Linwood area. At that time there were 228 AUMs available on about 300 acres. Due to fluctuations in water levels of the Flaming Gorge Reservoir, the permit remained a temporary permit. At that time, it was felt that the irrigated unit, which was most of this allotment, would be used better as an allotment of its own, and not with on-off provisions, and appropriate changes were made to the permit.
- In **1976**, a permit was issued for the South Valley On-Off Allotment, for 300 head of cattle, to be grazed one year from December 1 to December 31, and the next year from November 1 to November 30. In 1976 the South Valley Allotment temporary permit expired.
- In **October of 1977**, the special use permit grazing system was eliminated, and a term grazing permit for 360 head on the Linwood Allotment was approved. In November 1977, a letter documenting allowable utilization levels stated that browse use would be limited to 20% of current year's growth for sagebrush, 25% for mahogany and bitterbrush, and 60% for grasses and forbs.
- The **1978** season authorized 140 head of cattle to use the Linwood Allotment from May 1 to May 30. In 1978, a refund was issued for 100 head that were not able to graze the South Valley Allotment from November to December.
- The **1979** season authorized 280 head on Linwood on October 1. In 1979 a three-year term permit was issued allowing the permittee to run 301 cattle from November 15 to December 15 on the South Valley Allotment.
- Early **1980s**, a Forest Service administrative horse pasture (20 plus acres) was established within the Linwood Unit. A horse shed was also constructed within this pasture. The administrative use of this pasture and shed was discontinued in 1999.

- In **1981**, 360 head were authorized on the Linwood Allotment from May 1 to May 30 and October 15 to November 15, not to exceed 500 AUMs between the two seasons. The South Valley On-Off Allotment was approved for 301 head from November 15 to December 15.
- In **1982**, it was proposed to make a permit modification to combine the Linwood Allotment and the South Valley Allotment into one allotment, the Linwood-South Valley Allotment. At that time, through 1986, 500 AUMs (average annual use) were authorized for the Linwood Unit with dates of May 1 to June 1 and October 14 to November 15. In the South Valley Unit, it was proposed for 301 AUMs from November 15 to December 15. The South Valley Unit could not be utilized for the full season during 1981 to 1983 due to early snow in the fall.
- In **1987 and 1988**, only 150 cow/calf pairs were authorized on the Linwood Unit.
- In **1989** the permittee was asked to remove cattle from South Valley after December 6, due to lack of forage from drought conditions, and only 150 head went onto the Linwood Unit.
- In **1990**, only 150 head were authorized for Linwood (from May 1 to May 31 and from October 15 to November 14), due to drought, and 301 were authorized in the South Valley from November 15 to December 14.
- In **1991**, 150 head were authorized on Linwood and 301 were authorized in South Valley.
- In **1992**, 200 head were authorized in Linwood and 301 were authorized in South Valley.
- In **1993**, 150 head were authorized in Linwood and 301 were authorized in South Valley.
- In **1994 through 2001**, 250 head were authorized in Linwood from about May 1 to June 1 and again from about October 15 to November 15 and 301 in the South Valley. In 1997 the entry date was delayed due to lack of forage growth and overall range readiness to sometime between May 3 to June 5. In 1999 the date was changed to May 6 to June 5 due to range readiness in the Linwood Unit. In 2000 the date was changed to May 3 and June 2 in the Linwood Unit. In 2001, 175 head were authorized.
- In **2002**, 175 were authorized on the Linwood Unit, but no cows were allowed during October 15 to November 14 due to drought and lack of forage in the Linwood Unit and 301 were authorized for the South Valley Unit, but only 200 were put on due to drought.
- In **2003**, 200 head were authorized in the Linwood Unit and 301 in the South Valley Unit.
- **Currently** – The Term Grazing Permit permits 801 AUMs (140 to 360 cow/calf pairs and 301 cows) on the Linwood-South Valley Allotment. The Allotment Management Plan (AMP) (1982) designates 301 (301 cows) of the 801 AUMs to be used on the South Valley Unit of the allotment, and 500 AUMs (between 140 to 360 cow/calf pairs) to be used on the Linwood Unit. The permit states that these 801 AUMs are permitted for variable numbers of cattle during variable periods of time. According to the current AMP, the 500 AUMs on the Linwood Unit are to be used from May 1 to June 1 and again from October 15 to November 15 by variable numbers of cattle ranging from 140 to 360 head.

Today the Linwood Unit consists of irrigated pasturelands. The majority of these lands continue to be irrigated and still maintain a distinct “pastoral” character. Waterfowl habitat values are high due to irrigation practices and its close proximity to the reservoir. This unit also has high recreational values associated with the undeveloped Linwood boat launch site and shore fishing along the reservoir. Noxious weeds are common in this unit and on adjacent private lands. Vegetative conditions of this unit range from poor to excellent.

The South Valley Unit is mostly mountainous terrain dominated by pinyon/juniper, sagebrush, and grass. The unit is valuable as big game winter range. Vegetative conditions of this unit are good to excellent.

C. PURPOSE AND NEED FOR ACTION

The purpose of this project is to continue cattle grazing on the Linwood-South Valley Allotment. The Ashley National Forest Land and Resource Management Plan (Forest Plan 1986) recognizes the continuing need for forage production from the Forest and determined that the Allotment is suitable for cattle grazing. The proposed action is intended to continue this historic use but also recognizes the need to improve wildlife habitats, recreational values, and vegetation resource conditions on portions of the allotment.

Forest Plan Guidance and Relevant Laws – Public Law 90-540 established Flaming Gorge National Recreation Area (NRA) on October 1, 1968. The Secretary of Agriculture is charged with administering, protecting, and developing Flaming Gorge NRA in a manner that “will best provide for (1) public outdoor recreation benefits, (2) conservation of scenic, scientific, historical, and other values contributing to public enjoyment, and (3) such management, utilization, and disposal of natural resources as will promote or are compatible with, and do not extensively impair, the purposes for which the recreation area is established.”

The Forest Plan (1986) superseded and incorporated the essential elements of the 1977 Flaming Gorge National Recreation Area Management Plan. This action responds to the goals and objectives outlined in the Forest Plan, and helps move the project area towards desired conditions described in that plan. Specifically:

Management Area Prescription: n₁ – National Recreation Area (NRA) Existing Situation: Activities and practices recognize and emphasize the recreation and wildlife values within the NRA. Standards and guidelines are modified to comply with Public Law 90-540. Range management n₁ Management Area direction states: “Maintain levels of utilization and investment based on allotment management plans where compatible with NRA direction (Forest Plan, Page IV-10).”

Applicable Forest Plan Standards and Guidelines that pertain to this allotment are as follows:

Range

1. Rangelands in unsatisfactory condition and which will not or cannot be improved will not be allocated to livestock grazing (Forest Plan, page IV-32).
2. Improve rangeland classified as unsatisfactory where cost effective (page IV-32).
3. Revise range allotment plans to be consistent with the Forest Plan (page IV-32).
4. Give priority to restoring needed existing structural improvements before constructing new ones (page IV-33).
5. Protect springs and seeps from grazing livestock where resource damage is occurring (page IV-33).
6. Limit forage utilization by livestock of key browse species on big game winter range to 20% (page IV-33).

7. Control all group I noxious weeds and all group II noxious weeds as defined by Forest Service Manual (FSM) 2200 (page IV-33).
8. Place additional responsibility and accountability on the permittees for livestock management and obtain at least 50 percent permittee participation in all range improvement construction and reconstruction costs (page IV-33).
9. Adjust allotment boundaries to reduce operating and management costs where possible (page IV-33).

Wildlife and Fish

1. Maintain all streams for a biotic condition index (BCI) of 75 or above and a habitat condition index (HCI) of 42 or above (page IV-30).
2. Resource management activities will be allowed if they will not adversely affect any Threatened and Endangered (T&E) or Sensitive species (page IV-30).
3. Transitory range may be allocated to wildlife (page IV-29).
4. Priority for new range structural improvements will be to develop water sources where there are no available sources within one mile. Design for development will allow for use by game animals and birds (page IV-33).
5. Limit forage utilization by livestock for key browse species on big game winter range to 20% (page IV-33).

Soil, Water, and Air

1. Protect all surface waters from chemical contamination (page IV-37).
2. Maintain or improve current stream channel stability ratings (page IV-37).
3. Rehabilitate disturbed areas based on these priority considerations:
 - a. Aquatic ecosystems
 - b. Riparian ecosystems
 - c. Riparian areas outside of aquatic and riparian ecosystems (page IV-41).

Recreation

1. Locate range fences to allow for movement of people and to exclude livestock from areas of concentrated recreational use (page IV-32).

Additional Information from Forest Plan, Appendix A – Flaming Gorge National Recreational Area Supplemental Direction.

1. (*Vegetation*) Implement appropriate livestock management systems to correct any adverse effects upon other resource values. Determine optimum productivity levels and incorporate into management systems... (Forest Plan, page A-5)
2. (*Wildlife and Fish*) Maintain and encourage nesting areas and other critical habitat of waterfowl, raptors, and other bird life...(Forest Plan, page A-6)
3. (*Wildlife and Fish*) Manage wildlife to provide for the maximum diversity of game and non-game species rather than directing management towards production of only a few key species...(Forest Plan, page A-5)
4. (*Outdoor Recreation*) Schedule range livestock use during “pre” and “post” tourist seasons, in areas of heavy public use where conflicts exist. Normally, livestock will not be allowed in designated recreation sites...(Forest Plan, page A-8)

5. (*Outdoor Recreation*) Provide for public access to shoreline areas; both trails and roads are needed...(Forest Plan, page A-8)
6. (*Esthetics*) Preserve natural beauty in the administration and maintenance of the reservoir, Green River, and related improvements...(Forest Plan, page A-8)
7. (*Esthetics*) Maintain open spaces and undeveloped areas throughout the NRA...(Forest Plan, page A-9)
8. (*Esthetics*) Consider scenic values and protection of natural beauty in any activity, which will affect air, water, or land resources... (Forest Plan, page A-11)
9. (*Esthetics*) Design livestock grazing systems so that the visiting public can view livestock properly utilizing the range resource...(Forest Plan, page A-10)
10. (*Forage*) Conflicts between grazing and recreation will be resolved in favor of recreation...(Forest Plan, page A-13)
11. (*Forage*) Design range fences to allow necessary and desirable movements of people and wildlife...(Forest Plan, page A-13)
12. (*Linwood Bay Management Unit*) Strive to maintain the green appearance of shoreline through cooperative agreements with adjoining private landowners as long as the other values of the NRA can be protected. If they cannot be protected, the pastures will be allowed to revert to natural vegetation...(Forest Plan, page A-33)
13. (*Linwood Bay Management Unit*) Resolve conflicts relating to stock watering...for access to the reservoir...(Forest Plan, page A-33)

D. PROPOSED ACTION

The action proposed by the Forest Service is to continue cattle grazing on the Linwood-South Valley Allotment as proposed in Alternative 3 with an increased emphasis on recreation, wildlife habitat values, and vegetative conditions.

E. DECISION FRAMEWORK

Given the purpose and need, the Flaming Gorge District Ranger will review the proposed action and the other alternatives in order to make the following decisions:

- Whether the proposed action will proceed as proposed, as modified by an alternative, or not at all.

F. PUBLIC INVOLVEMENT

The proposal was listed in the *Winter 1999 (January – March) Quarterly Schedule of Proposed Actions*. Public scoping began on June 21, 1999 when a request for comments was sent to approximately 60 individuals and groups. Two responses were received. On March 4, 2003 the project was re-scoped and distributed to approximately 65 people since almost four years had passed since the earlier scoping request. Four responses were received.

A copy of all letters and comments can be found in the project planning record located at the Flaming Gorge Ranger District office in Manila, Utah. The following list of individuals commented on the scoping letters:

June 27, 1999
Garie Henry

July 12, 1999

Utah Environmental Congress, Craig Axford

March 2003

JC. Brewer

March 25, 2003

State of Utah, Resource Development Coordinating Committee (RDCC), John Harja

March 26, 2003

Utah Environmental Congress, Craig Axford

April 7, 2003

U.S. Department of the Interior, Fish and Wildlife Service, Henry R. Maddux

In addition, as part of the public involvement process, the agency published a news release in the Green River Star, Rock Springs Miner, and Vernal Express newspapers on June 23, 1999 (see *Scoping* section in the project planning record).

Using the comments from the public and other agencies, the interdisciplinary team developed a list of Issues to address in this Environmental Assessment.

G. ISSUES

The Forest Service separated the issues into two groups: key and non-key issues. Key issues were defined as those directly or indirectly caused by implementing the proposed action. Non-key issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-key issues and reasons regarding their categorization may be found in the *Scoping* section in the project planning record.

As for key issues, the Forest Service identified four topics raised during scoping. These issues aided in alternative development, and include the following:

1. Vegetation – The short- and long-term effects of the proposal on vegetation and noxious weeds within the allotment.
2. Soils – The short- and long-term effects of the proposal on soil compaction and erosion within the allotment.
3. Wildlife – The short- and long-term effects to big game and sage-grouse habitat in the South Valley Unit and waterfowl habitat in the Linwood Unit.
4. Recreation – The short- and long-term effects of grazing on recreational use and enjoyment of the Linwood boat ramp area, dispersed recreation along Flaming Gorge Reservoir, waterfowl viewing and hunting at the recently constructed waterfowl pond, and general recreational use of the South Valley Unit.

CHAPTER 2 – ALTERNATIVES

This chapter describes and compares the alternatives considered for the Linwood-South Valley Allotment Environmental Assessment. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

A. ALTERNATIVES

ALTERNATIVE 1 – MAINTAIN CURRENT GRAZING (NO ACTION)

Under the No Action Alternative, current management plans and permits would continue to guide management of the project area (refer to Maps 3 and 6 in Appendix A). The current Term Grazing Permit permits 801 Animal Unit Months (AUMs) equivalent to 607 cow/calf pairs for one month on the Linwood-South Valley Allotment. The Allotment Management Plan (AMP) (1982) designates 301 cows of the 801 AUMs to be used on the South Valley Unit of the allotment and 500 AUMs (140 to 360 cow/calf pairs) to be used on the Linwood Unit. The permit states that these 801 AUMs are permitted for variable numbers of cattle during variable periods of time. The No Action Alternative would continue to follow the current AMP and Term Grazing Permit and allow 500 AUMs on the Linwood Unit to be used from May 1 to June 1 and again from October 15 to November 15 by variable numbers of cattle ranging from 140 to 360 head. Up to 301 cows would be permitted from November 15 to December 15 on the South Valley Unit.

The existing irrigation ditches would continue to be maintained within the Linwood Unit. A majority of these ditches would be “re-pulled,” which consists of dragging a metal plow, or similar tool, behind a tractor and removing the vegetation and other obstructions from the sides of the ditch. This would allow water to more easily flow through these ditches for better irrigation distribution. The permittee would continue to do all ditch maintenance and irrigation.

ALTERNATIVE 2 – NO GRAZING

Under Alternative 2, cattle grazing would not be allowed on Forest Service administered lands within the Linwood-South Valley Allotment (refer to Maps 4 and 6 in Appendix A). All allotment boundary fences would be kept in place and maintained to restrict livestock from adjacent private lands from grazing the allotment. Approximately 2 miles of interior fencing would be removed.

ALTERNATIVE 3 – MAINTAIN FALL GRAZING ON THE SOUTH VALLEY UNIT AS CURRENTLY MANAGED, AND CHANGE CATTLE NUMBERS, SEASONAL USE, AND BOUNDARIES ON THE LINWOOD UNIT.

Under Alternative 3, the Linwood Unit would be divided along the Linwood Road and separated into two pastures, South Linwood (106 acres) and North Linwood (60 acres) (refer to Map 5 in Appendix A). South Linwood would be grazed once annually for approximately one month from June 15 through July 14 (this date would be subject to change based upon monitoring

results). North Linwood, including the Linwood Pond Enclosure, would be grazed once approximately every five years to maintain residual cover for waterfowl nesting habitat. This grazing would occur in the fall following the main recreation season. On the year North Linwood and the Linwood Pond Enclosure were grazed, South Linwood would be rested from grazing. This alternative would exclude cattle from the undeveloped Linwood boat launch recreation area except for once every five years when cattle are in North Linwood.

Alternative 3 would allow grazing to occur in South Linwood once during the summer and would reduce the current number of cattle on the Linwood Unit from 500 to 164 AUMs (refer to Map 6 in Appendix A). This would be about a 67% reduction in a combination of time, numbers, and acres. Cattle numbers in South Linwood would be initially set at 124 cows/calf pairs. No reduction would occur in the South Valley Unit. Alternative 3 would reduce the number of cattle on the entire allotment from 801 AUMs to 465 AUMs or 42%. Numbers of cattle and season of use are estimates that may be altered based on annual range conditions, forage production, livestock management, long-term range trend and/or other resource needs. The South Valley Unit would continue to be grazed annually during fall/winter by about 301 cows.

Alternative 3 would require 0.7 miles of fencing along the south side of the Linwood Road. The 0.2-mile portion of this fence that is already in place would need to be reconstructed. The remaining 0.5 miles would require new construction, would include a cattleguard, and would tie into the reservoir east of the Linwood Boat Launch area.

The existing irrigation ditches would be maintained within the Linwood Unit. A majority of these ditches would be “re-pulled”, which consists of dragging a metal plow, or similar tool, behind a tractor and removing the vegetation and other obstructions from the sides of the ditch. This would allow water to more easily flow through these ditches for better irrigation distribution. Sections of pipe, if needed, would also be used within the existing ditches to better distribute water. The permittee would continue to do all ditch maintenance and irrigation.

ALTERNATIVE 4 – CHANGE GRAZING IN THE SOUTH VALLEY UNIT FROM FALL/WINTER TO SPRING/SUMMER TO MAXIMIZE BROWSE PRODUCTION, AND CHANGE CATTLE NUMBERS, SEASONAL USE, AND BOUNDARIES ON THE LINWOOD UNIT.

Under Alternative 4, the Linwood Unit would be divided into two pastures and grazing would be managed as described in Alternative 3 (refer to Maps 5 and 6 in Appendix A). The grazing schedule on the South Valley Unit would be changed from fall/winter (November 15 - December 15) to spring/summer (May 1 to May 31) in order to maximize browse production for wildlife by intensively grazing the grass/forb understory. Under Alternative 4, the South Valley Unit would be grazed by about 301 cows or 228 cow/calf pairs for about one month. Cattle numbers and season of use are estimates that may be altered based on annual range conditions, forage production, livestock management, long-term range trend and/or other resource needs.

B. ACTIONS COMMON TO ALL ACTION ALTERNATIVES

- Remove non-functional fencing within the Linwood and South Valley Units.
- Remove the horse shed on the old Linwood Horse Pasture.

- Continue to treat noxious weeds on the allotment.
- Remove encroaching Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarix ramosissima*) on the Linwood Unit.
- Maintain cattails (*Typha* spp.) within the North Linwood Pasture at levels that maximize waterfowl habitat and production (maintain a diversity of species).
- Any improvements (new fences, water troughs, new irrigation ditches or structures) within the allotment will require cultural resource clearance prior to construction.
- Manage noxious weed infestations through the use of an integrated approach as per the Ashley National Forest's Noxious Weed Management Decision Notice (1994) and the Henry's Fork Waterfowl/Wetland Enhancement Project Decision Notice (1996). Areas important to waterfowl will be managed to maintain habitat complexity and to prevent a monoculture of cattails and/or other less desirable species from becoming established.
- Improve the vehicle access road on the peninsula south of the Linwood Boat Launch area. The dirt road that heads south from the Linwood Road near the Linwood Boat Launch area and continues along the existing fence line on the east side of the old Linwood Horse Pasture would be leveled out at the junction with the Linwood Road to prevent erosion caused by irrigation water draining through this section. This road would also be obliterated to allow for restoration of the road. Motorized access would continue along the road along the reservoir's edge.

C. COMPARISON OF ALTERNATIVES

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities/resources and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 1. Comparison of the four alternatives by activity or resource.

Activity or Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Grazing Management¹	No action. <u>Linwood Unit</u> - continue grazing 500 AUMs (May 1 to June 1 and Oct. 15 to Nov. 15) <u>South Valley Unit</u> - continue grazing 301 AUMs (Nov. 15 to Dec. 15).	No cattle grazing permitted on the allotment.	<u>Linwood Unit</u> reduced to 164 AUMs, and separated into: <u>North Linwood Pasture</u> – 60 acres, grazed once every five years (in the fall). <u>South Linwood Pasture</u> – 106 acres (summer grazing). <u>South Valley Unit</u> - continue grazing 301 AUMs (fall/winter).	<u>Linwood Unit</u> - Same as Alternative 3. <u>South Valley Unit</u> graze 301 AUMs (Spring/summer or May 1 to May 31).
Irrigation Ditches	Maintain/enhance existing ditches in the Linwood Unit. Improve existing ditches.	No ditches would be maintained or improved.	Maintain/enhance existing ditches in the Linwood Unit. Improve existing ditches and add new ditches or pipelines as needed.	Maintain/enhance existing ditches in the Linwood Unit. Improve existing ditches and add new ditches or pipelines as needed.
Fences	Remove non-functional fencing in the Linwood and South Valley Units.	Remove approximately 2 miles of interior fence. Maintain allotment boundary fences.	Remove non-functional fencing in the Linwood and South Valley Units. Construct approximately 0.5 miles and reconstruct approximately 0.2 miles of fencing in the Linwood Unit.	Remove non-functional fencing in the Linwood and South Valley Units. Construct approximately 0.5 miles and reconstruct approximately 0.2 miles of fencing in the Linwood Unit.
Roads	Improve vehicle access road onto the peninsula by leveling road at junction of Linwood Road and dirt road and obliterating the dirt road.	Improve vehicle access road onto the peninsula by leveling road at junction of Linwood Road and dirt road and obliterating the dirt road.	Improve vehicle access road onto the peninsula by leveling road at junction of Linwood Road and dirt road and obliterating the dirt road.	Improve vehicle access road onto the peninsula by leveling road at junction of Linwood Road and dirt road and obliterating the dirt road.
Noxious Weeds/Vegetation	Continue to treat noxious weeds on the allotment. Remove encroaching Russian olive and tamarisk on the Linwood Unit.	Continue to treat noxious weeds on the allotment. Remove encroaching Russian olive and tamarisk on the Linwood Unit.	Continue to treat noxious weeds on the allotment. Remove encroaching Russian olive and tamarisk on the Linwood Unit.	Continue to treat noxious weeds on the allotment. Remove encroaching Russian olive and tamarisk on the Linwood Unit.
<u>VEGETATION²</u> <u>Threatened (T), Endangered (E), and USFS Region 4 Sensitive Species (S)</u>				

Activity or Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Stemless penstemon (S)	No impact.	No impact.	No impact.	No impact.
RANGELAND CONDITIONS	No improvement, continued areas of bare ground in areas not irrigated. Potential decrease in plant composition, diversity, and litter.	Decrease in bare ground and increase in plant composition, diversity, and litter.	Potential decrease in bare ground and increase in plant composition, diversity, and litter.	Potential decrease in bare ground and increase in plant composition, diversity, and litter on the Linwood Unit. Potential increase in bare ground and soil loss on the South Valley Unit.
SOILS	No improvement.	Potential increase in ground cover and decrease in bare ground.	Decreased impacts due to fewer cattle on Linwood Unit. No change on South Valley Unit.	Decreased effects on the Linwood Unit. Potential increase in bare ground and soil movement on the South Valley Unit.
<u>HYDROLOGY</u>	No improvement.	Improvement to cattle crossing area.	Improvement to cattle crossing area.	Improvement to cattle crossing area with potential for increased erosion in South Valley Unit.
Watershed				
Water Quality	No measurable effect.	No measurable effect.	No measurable effect.	No measurable effect.
RECREATION	Potential for localized conflicts between public recreation and cattle at the Linwood Boat Launch area would continue.	No conflicts between public recreation and cattle.	Decreased conflicts between public recreation and cattle four out of five years in concentrated use areas. Increased potential for conflicts during recreation season south of Linwood road.	Same as Alternative 3 for Linwood Unit, more potential for conflict with early season use in South Valley Unit.
HERITAGE	No irreversible impacts. Site-specific modifications may affect cultural sites.	No impacts.	No irreversible impacts. Site-specific modifications may affect cultural sites.	No irreversible impacts. Site-specific modifications may affect cultural sites.
SOCIO-ECONOMIC	No change.	Negative economic and cultural effect to the permittee and community without continuing operations of ranch.	Negative economic effect to the permittee and community due to reduction in total livestock use. Limited cultural loss. With expected continuing operations of ranch all negative effects lessened.	Same as Alternative 3.

Activity or Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<u>WILDLIFE²</u> <u>Threatened (T), Endangered (E),</u> <u>Forest Sensitive (S), and</u> <u>Management Indicator Species</u> <u>(MIS)</u>				
American Peregrine Falcon (S)	No impact.	No impact.	No impact.	No impact.
Bald eagle (T)	May effect, not likely to adversely affect.	No effect.	May effect, not likely to adversely affect.	May effect, not likely to adversely affect.
Common Loon (S)	No impact.	No impact.	No impact.	No impact.
Golden eagle (MIS)	No impact.	No impact.	No impact.	No impact.
Greater sage-grouse (S/MIS)	May impact individuals, but would not lead towards a federal listing.	Positive impact due to a potential increase in residual cover on the South Valley Unit.	May impact individuals, but would not lead towards a federal listing.	May impact individuals, but would not lead towards a federal listing.
Lincoln's sparrow (MIS)	Negative effect due to a reduction in woody riparian communities.	Positive effect due to a potential increase in woody riparian communities.	Positive effect due to a potential increase in woody riparian communities.	Positive effect due to a potential increase in woody riparian communities.
Mountain plover (S)	May impact individuals, but would not lead towards a federal listing.	Possible negative impact due to the increase in residual cover in the Linwood Unit, but would not lead towards a federal listing.	May impact individuals, but would not lead towards a federal listing.	May impact individuals, but would not lead towards a federal listing.
Mule deer/Elk (MIS)	No impact.	Positive impact due to removal of fences and improved access within the allotment.	No impact.	No impact.
Northern goshawk (S/MIS)	No impact.	No impact.	No impact.	No impact.
Pygmy rabbit (S)	May impact individuals, but would not lead towards a federal listing.	No impact.	May impact individuals, but would not lead towards a federal listing.	May impact individuals, but would not lead towards a federal listing.
Song Sparrow (MIS)	Negative effect due to a reduction in woody riparian communities.	Positive effect due to a potential increase in woody riparian communities.	Positive effect due to a potential increase in woody riparian communities.	Positive effect due to a potential increase in woody riparian communities.
Spotted bat (S)	No impact.	No impact.	No impact.	No impact.

Activity or Resource	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Trumpeter Swan (S)	No impact.	No impact.	No impact.	No impact.
Townsend's big-eared bat (S)	No impact.	No impact.	No impact.	No impact.
FISHERIES² <u>Threatened (T), Endangered (E),</u> <u>Sensitive (S), and Management</u> <u>Indicator Species (MIS)</u>				
Colorado Cutthroat Trout (S/MIS) ³	No impact.	No impact.	No impact.	No impact.
Macroinvertebrates (MIS)	No impact.	No impact.	No impact.	No impact.

¹ Numbers of cattle and season are estimates and may be altered based on annual range conditions, forage production, livestock management, and long-term range trend and/or other resource needs.

² Only Threatened, Endangered, Sensitive, and Management Indicator Species that have suitable habitat (including foraging habitat) within the project analysis area were included in the table.

³ Suitable habitat for Colorado River Cutthroat Trout is not found within the project analysis area.

D. MITIGATION MEASURES

The alternatives were developed to address key issues (see Chapter 1, Section G. Issues). Therefore, no mitigation measures were necessary.

E. MONITORING

Two broad levels of monitoring were identified, implementation and effectiveness.

Implementation monitoring determines if the selected alternative was implemented as described in the decision. If Alternative 1, 3, or 4 were selected for implementation, monitoring would include annual, short-term monitoring to determine if livestock are managed as directed in the Allotment Management Plan (AMP) and Annual Operating Instructions (AOI). This monitoring would be completed through field observations documented in allotment notes. For example, allotment administrators would determine if livestock were moved to a different pasture or removed from the allotment before the prescribed utilization parameters were met (forage utilization, stubble height, and browse utilization). Livestock operators will assist in allotment monitoring. At the end of each year, these observations would be summarized and a determination made if on-the-ground management practices met the prescribed parameters. If these parameters were exceeded, administrative action described in FSH 2209 16.23 would be followed. If Alternative 2 were selected for implementation, monitoring would include periodic checks through the field season to determine if trespassing livestock are grazing the National Forest within the analysis area. If this occurs, action under 36 CFR 261.7 would be taken.

Effectiveness monitoring determines if assumptions made in this analysis are correct. For example, if Alternative 3 is selected, the environmental effects described for Alternative 3 in Chapter 3 are expected to occur. Effectiveness monitoring would be accomplished through the maintenance of existing long-term monitoring sites. Methods used include permanent photo points, line-intercept, and nested frequency transects. Effectiveness monitoring would also include the documentation, mapping, and treatment of noxious weed infestations.

CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the comparison of alternatives table (see Chapter 2, Table 1).

Several physical, biological, social and economic environments are not expected to be directly or indirectly impacted by the proposed actions. After initial consideration, these were dropped from detailed review in the analysis of the alternatives. These include the following:

Air – The proposed action and alternatives as described are not expected to impact air quality on the allotment.

Fire – The proposed action and alternatives as described do not include the use of fire to reach management objectives. The alternatives as described are not expected to have an impact on increasing or decreasing the risk of fire on the allotment. Use of prescribed fire on the allotment in the future would require separate National Environmental Policy Act (NEPA) documentation prior to implementation.

Minerals – The proposed action and the described alternatives will not impact mineral resources on the allotment.

Roadless/Wilderness/Wilderness Study Areas – The proposed action and alternatives will not impact roadless, wilderness, or wilderness study areas because none of these areas are located within or directly adjoin the Linwood-South Valley Allotment area.

Transportation – The proposed actions in the alternatives will make some modifications to an existing non-system road. These proposed modifications were discussed in Chapter 2, Section B, *Actions Common To All Action Alternatives*. The effects from these proposed modifications will be discussed in Chapter 3, Section G, *Recreation*.

A. PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIVITIES

Several past, present, and reasonably foreseeable activities were identified as being common to all physical, biological, social, and economic environments directly, indirectly, or cumulatively affected by the actions proposed in each alternative. This section will describe those activities that could cumulatively affect these environments. The effects of these activities on the physical, biological, social, and economic environments described in this analysis were considered by resource area and each resource may refer to this section when describing the analysis area and cumulative effects in their respective sections.

The Linwood South-Valley Allotment falls mostly within the Henry's Fork-Flaming Gorge 6th code watershed totaling 32,953 acres. Approximately 691 acres (2%) of the 3,680 acres on the Linwood-South Valley Allotment fall within an adjoining watershed, and are located along a rocky bluff bordering the Flaming Gorge Reservoir with limited access to cattle (see Map 1 in Appendix A).

There are approximately 7,812 total National Forest acres within the watershed area. Correcting for the 691 acres of the allotment within the adjoining watershed, the Linwood South Valley Allotment represent about 9.0% of the cumulative effect's area. Of this area, the Linwood Unit represents approximately 0.5%, and the South Valley Unit represents about 8.5% of the watershed area.

Actions considered for cumulative impacts include activities that have occurred, are occurring, or are reasonably foreseeable within the cumulative effects boundary. These activities include the proposed action, cattle grazing on private lands, fuel wood and post wood harvesting, conifer encroachment removal in pinyon/juniper woodlands, big game hunting, road maintenance, dispersed and managed land and water based recreational activities, and the possibility of prescribed fire. These activities may cumulatively affect each resource differently. Additional cumulative effects specific for each resource may be described in the respective cumulative effects section.

Cattle grazing is an historical and ongoing yearlong activity on private lands. Private land grazing revolves around the use of irrigated fields that also function as holding areas for cattle during the winter season. The Linwood-South Valley Allotment is one of few allotments on public lands within the cumulative effects area. Cattle are allowed on the allotment only for the specified seasons described in this EA and are moved back onto private lands for the remainder of the year.

A strip of private land, about 14-acres in size, is located on the east side of the Linwood Pond Exclosure outside of the forest boundary (see Map 3 in Appendix A). Cattle grazing in the Linwood Unit have access to this private land because it is not fenced off from the rest of the allotment. In the state of Utah, the private landowner is required to fence his/her private land from public land. This private land is not considered part of the Linwood-South Valley Allotment, nor was the acreage included in any resource analysis. It is mentioned here since it would cumulatively affect livestock grazing by providing additional forage when cattle are grazing on the Linwood Unit.

Forest and woodland stands within the analysis area have been minimally harvested as a source of posts and fuel wood. No large scale historical harvesting was observed on the allotment or on private lands within the cumulative effects area. Future related woodland cutting is expected on approximately 140 acres scheduled for conifer encroachment within the Linwood-South Valley Allotment boundary as per the Conifer Encroachment Project Decision Memo (2003). These treatments include thinning small diameter juniper (less than 6 inch root collar diameter). Similar small-scale manipulation of woodlands on private lands can reasonably be expected to occur at some point during the life of this allotment grazing analysis.

Ongoing water based recreational activities associated with use of the Flaming Gorge Recreation Area are expected to continue. Dispersed recreation is also expected to continue, but most activities are generally confined to beach areas along the reservoir. Most recreational activity occurs during the summer and fall periods and involves the use of roads and trails providing access to the Flaming Gorge Reservoir. Limited snowmobile use is possible, but uncommon,

due to low snow levels during most winters. All-terrain vehicle (ATV) use is a common use on trails in the South Valley Unit. This type of use is expected to increase in the future. Recreational activities on the Forest in general are expected to increase by approximately 7% per year. Recreation programs are currently being implemented to educate and limit resource damage as a result of shifts in recreational uses.

Approximately 94.9 miles of road and trails are included within the watershed boundary area. The majority of road miles includes hard gravel or paved county or state roads (State Highways 44 and 43), with the remaining miles consisting of low maintenance dirt and two track dirt roads. Unclassified sections of trails are also expected below the high water mark along the reservoir shoreline. Varying levels of maintenance are expected on all roads in the foreseeable future. Regular yearly maintenance can be expected on hard gravel or paved roads, but will occur sporadically for other roads and trails in the analysis area.

Hunting, fishing and other recreational activities are expected in association with Utah hunting and fishing seasons and regulations. Mule deer and small game hunting are the most common hunting activities expected within the cumulative effects area.

Neither historical wildfires nor prescribed fires are common occurrences within the cumulative effects area. The xeric, or dry nature of pinyon/juniper and sagebrush community types in the area makes wildfire events rare. Additionally, most of the private lands within the analysis area are actively managed as irrigated hay fields or pastureland that reduces the risks of fire. Prescribed fire within Forest Service portions of the area may occur in the future in response to wetland habitat needs within the Henry's Fork Wetland areas.

Noxious weed infestations would continue to be managed through the use of an integrated approach that includes mechanical, biological, and chemical methods as per the Ashley National Forest's Noxious Weed Management Decision Notice (1994) and the Henry's Fork Waterfowl/Wetland Enhancement Project Decision Notice (1996). Areas important to waterfowl would be managed to maintain habitat complexity and to prevent a monoculture of cattails and/or other less desirable species from becoming established.

B. VEGETATION/GRAZING MANAGEMENT

1. ANALYSIS AREA

The analysis area for vegetation and grazing management is the Linwood-South Valley Allotment boundary. This area was used to evaluate cumulative effects.

2. EXISTING CONDITION/AFFECTED ENVIRONMENT

Vegetation of the Linwood-South Valley Allotment is discussed by ecological unit as delineated in the Land Systems Inventory (LSI) of the Ashley National Forest. Ecological units associated with the Linwood-South Valley Allotment are displayed on Map 7 in Appendix A. Location of these studies referred to in this and other chapters are also shown on Map 7, and a summary of these studies is provided in Appendix B. Existing and desired condition are discussed by ecological unit and background information is given from which desired condition is based. Inherent capabilities of the land and known values are the basis for desired condition. Values are

consistent with management area prescriptions and standards and guidelines given in the Forest Plan for the Ashley National Forest. Values of plants for watershed protection are listed in Region Four Range Analysis Handbook of May 18, 1993 (FSH 2209.21). Studies referred to below can be found at the Flaming Gorge Ranger District in the 2210-1 Range Studies folders.

Antelope Flat 1 Ecological Unit (AF1)

Existing Condition: The substrate associated with this land-type is sandy-gravelly pediments typical of Henry's Fork River and perhaps the Green River formations. Prior to settlement, communities of Wyoming big sagebrush/needle-and-thread grass dominated much of this land-type. However, in places, Mancos Shale has been washed over the pediment surface and, depending on thickness of this material, halophytes including greasewood are present and were likely more common prior to conversion to pasture land.

Much of AF1 on this allotment was in private ownership prior to establishment of the Flaming Gorge National Recreation Area. Under private ownership it was converted to irrigated and seeded pasture. Species including Baltic rush (*Juncus articus*) and Nebraska sedge (*Carex nebrascensis*) dominate where it has been regularly irrigated. With continuous irrigation, cattail has increased. Seeded grasses including pubescent or intermediate wheat grass (*Elymus hispidus*) dominate places that receive little or no irrigation. Based on gradients, production, and species composition, the unit is suitable for livestock grazing.

Desired Condition: The current condition is recommended as desired with the exception of the presence of noxious and invasive weeds. To return the Linwood pastures to native species would require plowing and seeding, herbicide application and seeding, or a combination of plowing, herbicide application, and seeding. Seeding native species has a high potential for failure in this area of about 9 inches annual precipitation (Hull 1974). Thus, multiple seeding applications may be needed to establish native plants.

Hull (1974) evaluated performance of 90 plant taxa including many natives in seedings in rangelands of southern Idaho. Where annual precipitation was less than 25 centimeters (10 inches), only 17 of the 90 taxa rated over 1 on a relative scale of 1-10. Of these 17, only 6 were natives, and none of these natives rated over 2.1. Phases of crested wheatgrass rated from 7.7 to 9.5. Pubescent wheatgrass rated at 6.2 and intermediate wheatgrass rated at 5.1. No other taxon rated over 5.

Pubescent wheatgrass is one of the species present in the Linwood Pastures. It is a highly competitive species and its presence and local dominance indicates additional difficulty in establishing native species. A non-selective herbicide would be required to reduce competition from this plant.

The current condition is also consistent with the desire to maintain or improve habitat for waterfowl (Forest Plan 1986, pages A-1 to A-47). The area is of low gradient and produces sufficient forage to support livestock grazing.

Antelope Flat 2 Ecological Unit (AF2)

Existing Condition: Mancos shale or other fine sediments dominate the substrate of this ecological unit. Soils derived from these materials are often dominated by clay. In places pediments of Antelope Flat 1 (AF1) underlay the fine sediments of this unit, however, Mancos shale or other fine sediments have been deposited over the pediment. The fine sediments tend to dominate the rooting zone of most plants and dictate potential plant communities. Wyoming big sagebrush (*Artemisia wyomingensis*)/western wheat grass (*Elymus smithii*) communities cover much of the unit. Halophytes and possibly selenophytes are present in the more saline or alkaline places. These include greasewood and saltgrass (*Distichlis spicata*). Wyoming big sagebrush is mostly restricted to drainage ways especially on the valley alluvium where it is sometimes the dominant shrub. However, Wyoming big sagebrush is the dominant shrub across much of the AF2 unit on the west side of Flaming Gorge Reservoir where it is not mostly confined to swales. At this site sandberg bluegrass (*Poa secunda*) and galeta (*Hilaria jamesii*) are common grasses while squirreltail (*Elymus elymoides*) is one of the few native grasses adapted to most of the flatter areas where the marine shale is the substrate. Greasewood (*Sarcobatus vermiculatus*) is sometimes present, but mostly confined to swales. The grass rich communities seem to be related to the sandstone lenses or beds of the Hilliard Shale.

Based on gradient, production, and species composition, the area is suitable for livestock grazing, however potential for ground cover and forage production is lower than on AF1. Lower values and likely higher potential for negative impacts could be associated with livestock compared to AF1.

Desired Condition: Desired condition for this ecological unit is to maintain shrub/grass and grass/forb communities with species rated with a moderate to high value for watershed protection. These communities are influenced by the soils within the unit. In response to the salt rich, low porosity and permeability, and other features of the Hilliard and Mancos Shale that are unfavorable for plant growth, diversity of plant species is restricted to a few species adapted to the conditions of this shale. Such conditions are inherent to this unit, and are included in desired conditions. Gardner saltbush (*Atriplex gardneri*) is well adapted and it is often the dominant plant on flats where it is sometimes about the only plant of any high frequency.

North Flank 3 Ecological Unit (NF3)

Existing Condition: Alluvial bottoms and side slope of slopewash colluvium dominate this unit. Wyoming big sagebrush/needle-and-thread grass (*Stipa comata*) communities dominate with low potential for displacement of this community by Utah juniper (*Juniperus utahensis*). Gradients are typically less than 10%. Forage production is sufficient to support livestock grazing. This type has high value for wintering wild ungulates.

Current vegetation condition indicates grazing practices of the past decade or more have maintained values for wintering wild ungulates. Wyoming big sagebrush is the principal winter forage species. Studies 4-1E and 4-1W indicate sagebrush is being maintained at equal or greater cover under livestock grazing compared to no livestock grazing. The slow advance of Utah juniper into sagebrush/grass communities of this land-type threatens values associated with sagebrush/grass. Utah juniper is common to abundant on adjacent areas.

Studies 4-1E and 4-25 indicate the graminoid component has been maintained under the grazing system of the past several years. Studies 4-1E and 4-1W indicate ground cover is at about 85% of potential under livestock grazing compared to no livestock grazing. These studies also indicate higher frequency of graminoids and forbs under livestock grazing compared to no livestock grazing.

Desired Condition: Desired condition for this ecological unit is to maintain sagebrush/grass communities with moderate to high value for watershed protection. Treatment of the encroachment by Utah juniper will be required to maintain these sagebrush/grass communities. Studies indicate ground cover to be at about 85% of potential.

North Flank 4 Ecological Unit (NF4)

Existing Condition: This includes slope-wash colluvium from the Curtis Formation over Morrison Formation and exposed Morrison Formation. Areas of slopewash colluvium tend to be covered with Wyoming big sagebrush/grass communities with potential for slow displacement by Utah juniper. In contrast to NF3, Sandberg bluegrass is often more common than needle-and-thread grass. Areas of exposed Morrison Formation tend to support desert shrub communities. The slopewash material is more resistant than the Morrison and tends to be comparatively stable while rills and gullied drainage ways are common in the Morrison.

Although similar in gradient to NF3, this unit is not as well suited to livestock grazing due to lower productivity, less ground cover, and more erosive soils. The key area of this unit is the sagebrush/grass type, which is the area within the ecological unit most selected by cattle. Allowable use by livestock should be based on this community type.

Study 4-41 shows Utah juniper advancing into the sagebrush/grass community. Utah juniper is common on dip slopes of Curtis and Entrada Formations to the south. It is desirable to maintain sagebrush-grass communities on NF4 to provide soil stability.

Desired Condition: Desired condition for this ecological unit is sagebrush/grass communities with moderate to high value for watershed protection. Treatment of encroachment by Utah juniper will be required to maintain these sagebrush/grass communities.

North Flank 15 Ecological Unit (NF15)

Existing Condition: This ecological unit includes sandstone outcrops, slopewash colluvium, and small basins or drainages of alluvium in Navajo Sandstone. Curl-leaf mountain mahogany (*Cercocarpus ledifolius*) is common on outcrops and areas of shallow soil over sandstone. Pinyon pine (*Pinus edulis*) and/or juniper dominate much of the area. Wyoming big sagebrush/needle-and-thread grass communities are scattered in the area mostly in drainages and in small basins. Potential for displacement of sagebrush/grass communities by pinyon and/or juniper is moderate to high.

Wyoming big sagebrush/needle-and-thread grass communities have low gradients and sufficient production to be suitable for cattle grazing. Much of the area covered by pinyon/juniper does not produce enough forage to be classified as suitable, although some areas of curl-leaf mountain mahogany might provide some forage. Pinyon and juniper are common to abundant on NF15.

Desired Condition: It is desirable to maintain at least the existing pockets of sagebrush/grass communities within the larger pinyon/juniper type to provide soil stability. Treatment of encroachment by Utah juniper will be required to maintain these sagebrush/grass communities. Areas of curl-leaf mountain mahogany should also be maintained.

North Flank 35 Ecological Unit (NF35)

Existing Condition: Rather short escarpments of Mowery Shale, Dakota Formation, Frontier Formation, and Morrison Formation dominate NF35, which often weather to semibarrens. Forage quantity and quality are inherently low on much of NF35, and soils are generally erosive. Plants including specialists are often found on exposed geologic strata. These include shortstem buckwheat (*Eriogonum brevicaulle*) and circle-pod pea (*Thermopsis rhombifolia*), found along the acidic Mowery Shale, and Duchesne spring parsley (*Cymopterus duchesnensis*) on the Morrison Formation.

Gradients are low enough on some of NF35 to indicate suitability for cattle. However, low forage quantity and quality make the area marginally or not suited for livestock grazing. Due to shallow or erosive soils and low forage value, management practices that discourage livestock use of NF35 should be employed here.

Desired Condition: Desired condition of this unit is to maintain perennial forbs with moderate to high value for watershed protection.

North Flank 70C Ecological Unit (NF70C)

Existing Condition: Dip slopes of Carmel including slopewash fans and eroding slopes of exposed Carmel dominate NF70C. Wyoming big sagebrush/needle-and-thread grass communities generally dominate the slopewash/colluvial fans. Utah juniper is common to abundant on other areas.

Rate of potential displacement of sagebrush/grass communities by pinyon and/or juniper appears to be low to moderate. Advance of juniper across this type indicates it is capable of dominating this entire unit.

Gradient and forage production are generally suitable for livestock grazing. Steeper slopes with exposed Carmel formation are not suitable due to low forage production and gradient. Study 4-24 indicates high vigor of graminoids can be concurrent with livestock grazing. Study 4-24B indicates sagebrush/grass communities can be dominated by graminoids of moderate to high value for watershed protection concurrent with livestock grazing. This study also shows ground cover likely within 85% of potential.

Desired Condition: Desired condition of this unit is to maintain Wyoming big sagebrush/grass communities, dominated by species with moderate to high value for watershed protection and maintenance of ground cover within 85% of potential.

North Flank 70E and L Ecological Units (NF70E and L)

Existing Condition: Dip slopes of Curtis (NF70L) and Entrada (NF70E) Formations dominate this land type. Plant communities include Utah juniper, pinyon/juniper, mountain brush, and black sagebrush/grass. Potential for displacement of sagebrush/grass communities by juniper and/or pinyon is low to high depending on location. All of this land-type on the allotment has potential to be dominated by pinyon and/or juniper.

Areas with greater than about 30% canopy cover of pinyon and/or juniper generally have too little forage to be suitable for livestock. Most NF70E and L are too steep with too little forage to be suitable for livestock grazing. In many areas on these units, sagebrush is closely hedged indicating it is high winter-value for wild ungulates. Composition of the understory is usually of moderate to high value for ungulates. Composition of mountain brush communities also indicates high value for wild ungulates.

Desired Condition: Desired condition for this unit is to maintain the existing sagebrush/grass communities with moderate to high value for watershed protection. Treatment of the encroachment by Utah juniper will be required to maintain these sagebrush/grass communities. The advance of pinyon and especially Utah juniper across some of this unit, presents a clear risk to the value of winter range for wild ungulates.

North Flank 75 Ecological Unit (NF75)

Existing Condition: This ecological unit is characterized by north facing dip slopes of Navajo sandstone with pinyon/juniper/alder-leaf mountain mahogany (*Cercocarpus montanus*). Areas with greater than about 30% canopy cover of pinyon and/or juniper generally have too little forage to be suitable for livestock. Most NF75 is relatively steep in most places with too little forage to be suitable. Livestock use on this unit is mostly transitory. Wyoming big sagebrush/grass patches are found in this unit and may provide some forage to livestock. Soils are not as erosive as ecological units NF 70E and L.

Desired Condition: Pinyon and juniper dominate a majority of this unit's desired condition is to maintain the continued succession of this community. Alder-leaf mountain mahogany and Wyoming big sagebrush/grass patches provide winter forage for wild ungulates. These areas should also be maintained. These communities should be dominated by species with moderate to high value for watershed protection and maintenance of ground cover within 85% of potential. Treatment of the encroachment by Utah juniper will be required to maintain these sagebrush/grass communities, but may be impracticable due to the existing pinyon/juniper densities.

North Flank 90 Ecological Unit (NF90)

Existing Condition: The escarpment of Flaming Gorge is typical of this unit. It includes cliffs of sandstone and eroding slopes of Moenkopi with sparse vegetation. Gradients are too steep and forage production is too low for the area to be suitable for livestock grazing. The unit presents a major barrier to cattle. Very little use has been made of the unit by cattle. It supports scattered pinyon and juniper trees and scattered mountain brush and desert shrub species. Study 4-21 is within this ecological unit but outside the allotment. This study shows typical conditions for the ecological unit in an area closed to livestock since the early 1960s.

Desired Condition: Desired condition is to maintain existing juniper and pinyon on the steep rocky slopes. Southerly slopes provide some winter forage for wild ungulates. The sagebrush/grass in these areas should also be maintained.

3. ENVIRONMENTAL CONSEQUENCES (Vegetation/Grazing Management)

Effects Common To All Alternatives – Current management direction for threatened and endangered species as contained in the Endangered Species Act of 1973 includes: "... all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." Under this direction the threatened plant species *Spiranthes diluvialis* (Ute ladies-tresses) was identified as a species known to occur near the area of analysis. Franklin (1992) has completed a detailed report for *Spiranthes diluvialis*. Plants of *Spiranthes diluvialis* have been found along the Green River between the Flaming Gorge Dam and the Forest boundary to the east (Franklin 1992). It has also been found below the National Forest on the major drainages of the south slope of the Uinta Mountains (Franklin 1992). A survey on the Forest produced no records of *Spiranthes diluvialis* in the Henry's Fork area. Distribution of other threatened, endangered, and proposed plant species is well removed from the portion of the Ashley National Forest for which this action is proposed. Based on this, no effect to these species or their habitat is determined for activities of the proposed action (BE/BA for Threatened and Endangered Plant Species in the project planning record).

For sensitive species current policy in Forest Service Manual (FSM 2670.3 includes "As part of the NEPA process, review programs and activities, through a biological evaluation, to determine their consistency with conservation strategies or their potential effect on sensitive species if no conservation strategy exists.

Actions are proposed to take place on the North Flank and Antelope Flat Land-type Associations. Two plants listed as sensitive have been found on these Land-type Associations. These are Petiolate wormwood (*Artemisia campestris* var. *petiolata*) and Stemless penstemon (*Penstemon acaulis*). All other sensitive plants of the Ashley National Forest are far removed in distance and habitat from the Linwood-South Valley Allotment. Survey data shows *Artemisia campestris* var. *petiolata* limited to an area outside the allotment included in this analysis. *Penstemon acaulis* is found within and outside the allotment. Due to its presence on the allotment, it is discussed below.

Stemless penstemon (*Penstemon acaulis*) is a short plant less than 3 centimeters tall. It is dormant in the winter when livestock are to be permitted on the allotment. Forage use indicates no impact to the plant on this allotment (Study 4-24D). Ground disturbance by livestock can be expected with winter grazing. *Penstemon acaulis* is found in greater abundance and greater vigor in occasionally used roadways than in areas adjacent to these roads as shown in a study site off the allotment (Study 3-26) and another on the allotment (Study 4-24D). This plant has colonized with vigor on areas disturbed by heavy equipment in construction of a communications facility west of Manila near study site 3-26. Density and size of plants on this disturbance is equal to or greater than that of plants in native habitat. Ground disturbance by cattle in winter is not expected to exceed the intensity of disturbance along the roadway studies

listed above. Based on these studies, sustainable populations of the plant are expected under the proposed livestock grazing. Based on this information, a determination of "No Impact" is made for sensitive plants in relation to the proposed actions in all alternatives.

a. Alternative 1 - Maintain Current Grazing (No Action Alternative)

1. Direct and Indirect Effects – The direct and indirect effects of continuing current management of livestock grazing on the Linwood Unit is a potential decrease in vegetation structure, diversity, density, composition, vigor, ground cover, and long-term forage production. Due to drought, unmanaged water distribution, proximity to private pastures, and grazing, noxious weeds such as white-top (*Cadaria draba*), perennial pepperweed (*Lepidium latifolium*), musk thistle (*Carduus nutans*), spotted knapweed (*Centaurea maculosa*), and Russian knapweed (*Centaurea repens*) have invaded a considerable portion of the Linwood Unit. The invasion of these noxious weeds as well as other annual and perennial weeds has greatly reduced the diversity of plant species and total forage production in this unit. Grazing twice annually (i.e., spring and fall) in the Linwood Unit has exacerbated these conditions because plants, especially the cool-season grasses, are grazed during the active growing season and then again during the re-growth period in the fall.

To estimate current forage production based on existing condition, a portion (approximately 46 acres) of the Linwood Unit was analyzed using the clip and weigh method to determine annual forage production (NRPH 2003; Goodrich 1990; Bonham 1989). The portion of the Linwood Unit analyzed included the western half of the peninsula located on the south side of the old Linwood Road and the existing undeveloped boat ramp extending to Flaming Gorge Reservoir. It also included the old administrative horse pasture and the wetter juncus/carex dominated area west of the horse pasture to the allotment boundary fence line separating U.S. Forest Service and private land.

Results from the clip and weigh analysis indicate that the 500 AUMs currently permitted is too high under present conditions. The Linwood Unit would likely continue in a downward trend, shifting from native/pasture-seeded grasses to invasive and noxious weeds if the stocking rate of 500 AUMs is continued and noxious weeds are not reduced.

The South Valley Unit would continue in its current trend as described in the *Existing Condition* section since neither an increase nor reduction of time or cattle numbers would occur in this unit.

2. Cumulative Effects – Including the cumulative effects documented in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*, an additional cumulative effect is wild ungulate use of vegetation. Wildlife species that could compete with livestock within the allotment boundaries include mule deer, antelope, bighorn sheep, and transitory elk. The use of vegetation, especially woody/browse species, by wild ungulates on the Linwood and South Valley Units would be additional to that of livestock utilization. These effects would be minimal on the Linwood Unit and appear to be negligible on the South Valley Unit.

The actions proposed in Alternative 1 will have no additional cumulative effects that will affect the overall condition of the vegetation within the allotment. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

b. Alternative 2 – No Grazing

1. Direct and Indirect Effects – Removal of livestock from the Linwood-South Valley Allotment would affect each unit in the allotment differently. Within the South Valley Unit, herbaceous vegetation structure and plant composition would not be expected to change since this unit is grazed in the winter when grasses are dormant. Long-term herbaceous plant productivity, vigor and ground cover would be expected to increase since plant material would not be removed in the fall/winter by grazing livestock. This would add additional biomass to the soil and aid in reducing soil erosion through an increase in herbaceous plant litter. Changes to shrub and browse vegetation would also be expected since any increase in herbaceous vegetation may result in a reduction in shrub and browse vegetation. However, all of these potential changes would be expected to be minor in and limited to localized areas where there were typically heavier concentrations of livestock grazing.

The effects associated with no livestock grazing on the Linwood Unit would be most pronounced in areas that are not irrigated. Where this is the case (estimated 10% of the unit) herbaceous vegetation would increase in structure, density, composition, long-term productivity, and plant vigor. Ground cover would also increase.

2. Cumulative Effects – Including the cumulative effects documented in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*, an additional cumulative effect, as described in Alternative 1, includes wild ungulate use of vegetation. The use of vegetation, especially the woody/browse species, on the Linwood-South Valley Allotment would continue by wild ungulates after the removal of livestock. These effects appear to be negligible.

The action proposed in Alternative 2 will have no additional cumulative effects that will affect the overall condition of the vegetation within the allotment. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

c. Alternative 3 – Maintain fall grazing on the South Valley Unit as currently managed, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – The division of the Linwood Unit into two separate pastures (North and South) would incorporate rest into the grazing system on this unit. South Linwood would be grazed annually for four years and then rested when North Linwood is grazed. Grazing North Linwood once every five years would promote long-term productivity and plant vigor within this pasture since periodic disturbance from grazing would remove decadent vegetation. When North Linwood is grazed, South Linwood would be rested for a grazing season. This type of grazing system would benefit plant species on the Linwood Unit as well as increase forage production.

Results from a clip and weigh analysis to determine annual forage production indicate that the 500 AUMs currently permitted in the Linwood Unit is too high under present conditions (Specialists Report in the project planning record Flaming Gorge Ranger District). The results from this analysis were used to determine an appropriate stocking rate for South Linwood, proposed in Alternative 3. Under present conditions South Linwood could sustain about 124 cow/calf pairs at 60% utilization for one month (Table 2). Typically 40% to 50% utilization is recommended to sustain healthy rangelands, however the Linwood Unit is currently irrigated throughout the summer allowing the potential for re-growth of vegetation after moderate use. Under Alternative 3, South Linwood would only be grazed once during the year, therefore, up to 60% utilization would be acceptable under these conditions. The reduction in cattle numbers combined with grazing the Linwood Unit only once a year would improve vegetation structure, density, composition, and ground cover.

Table 2. Estimated stocking rate for South Linwood in the Linwood Unit based on Alternative 3 (with permittee continued irrigation).

	Average Pounds Per Acre	Acres in Unit	%Utilization	Time (months)	Pounds Per Acre	AUMS	Cow/calf pairs
Total Production	2,040	106	60	1.0	790	164	124

Grazing management would also be improved through the implementation of Alternative 3 because grazing would be restricted from the Linwood Bay boat launch area as well as the Henry's Fork Wetlands Trail, which would reduce conflicts with other users.

The maintenance and/or new construction of irrigation ditches on the Linwood Unit would potentially change the plant community on the west side of South Linwood from a juncus/carex dominated community to native/pasture grass community. Proper irrigation would also increase forage production and plant diversity in each pasture on the Linwood Unit.

The South Valley Unit would continue in its current trend as described in the *Existing Condition* section since neither an increase nor reduction of time or cattle numbers would occur in this unit.

2. Cumulative Effects – Wild ungulate use of vegetation, as described in cumulative effects for Alternative 1, would be an additional effect on vegetation to those listed in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*.

The actions proposed in Alternative 3 will have no additional cumulative effects that will affect the overall condition of the vegetation within the allotment. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment

d. Alternative 4 – Change grazing in the South Valley Unit from fall/winter to spring/summer to maximize browse production, and change grazing numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – Under Alternative 4, the effects of livestock grazing on vegetation in the Linwood Unit would be the same as Alternative 3 since grazing management would be the same. A change from fall/winter to spring/summer grazing in the South Valley

Unit could potentially affect vegetation negatively. Spring/summer use in the South Valley Unit would likely result in the removal of more understory grass/forb vegetation during years when snow accumulation prevents access to these plants at the soil surface by cattle. To decrease competition from graminoid species to promote increased shrub/browse production would require intensive grazing over several years to achieve the desired effect. This type of intensive grazing could be detrimental to vegetation and especially soils in the South Valley Unit because some ecological units in this Unit are not as suitable to grazing due to shallow or erosive soils, less ground cover, and low forage value as described in NF4, NF15, and NF35. Other ecological units in the South Valley Unit that are marginally or not suitable to grazing due to steeper slopes, lower forage productivity and/or quality, less ground cover, and shallow or erosive soils include NF70C, NF70E and L, and NF90. To achieve even light use here by livestock would likely result in heavy use of adjacent, low gradient areas. Spring/summer grazing in these areas could encourage encroachment of Utah juniper into the sagebrush/grass community as documented in Study 4-41.

Current vegetation condition indicates grazing practices of the past decade or more have maintained values for wintering wild ungulates in the South Valley Unit. Wyoming big sagebrush is the principal winter forage species. Studies 4-1E and 4-1W indicate sagebrush is being maintained at equal or greater cover under livestock grazing compared to no livestock grazing. Studies 4-1E and 4-25 indicate the graminoid component has been maintained under the grazing system of the past several years. Studies 4-1E and 4-1W indicate ground cover is at about 85% of potential under livestock grazing compared to no livestock grazing. These studies also indicate higher frequency of graminoids and forbs under livestock grazing compared to no livestock grazing.

The lack of available water on the South Valley Unit could also force cattle to stay near the reservoir. Some of the Ecological units where cattle would have access to the reservoir include NF35 and NF4. These units are more susceptible to erosion due to shallower and more erosive soil types. The NF4 Ecological unit has shallower gradients suitable for livestock grazing but it is not suitable to livestock grazing due to lower productivity, less ground cover, and more erosive soils.

A shift to spring/summer grazing on the South Valley Unit would initiate a gradual change in understory plant species composition as cattle select for actively growing graminoid and forb species. Mechanical disturbance and a reduction in vegetation cover during this period would also increase the incidents of soil movement in response to summer and fall rainstorm events.

2. Cumulative Effects – Wild ungulate use of vegetation, as described in cumulative effects for Alternative 1, would be an additional effect on vegetation from those listed in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*.

The actions proposed in Alternative 4 will have no additional cumulative effects that will affect the overall condition of the vegetation within the allotment. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

C. SOIL

1. ANALYSIS AREA

Analysis area is the Linwood-South Valley Allotment boundary. This area was also used to evaluate cumulative effects.

2. EXISTING CONDITION/AFFECTED ENVIRONMENT

Soils on the allotment will be discussed by ecological unit as delineated in the Ashley National Forest Lands System Inventory. Some of the information on soils and formations come from the Geology of the Flaming Gorge Area Utah- Colorado-Wyoming, Geological Survey Professional Paper 490.

Linwood Unit

Antelope Flat 1 (AF1)

Soils in the Linwood Unit are represented by the Antelope Flat 1 (AF1) land-type. They are silty and or sandy soils with a high percentage of cobble and gravel sized rock with some calcareous cementation or hardpan developing at around 11 inches in the soil profile. They are well drained except where the calcareous hardpan forms an impervious layer. They are derived from deposits, predominantly quartzitic material from the Uinta Mountain group.

Further west in this unit another component of this land-type is influenced by the silts and clay from the Hillard Shale Formation and other fine grained deposits of alluvium and colluvium overlaying the pediment surface. Gravel and coarse fragments are found deeper in the soil profile or in drainage ways. These soils have slow permeability. The vegetation reflects these high water holding soils in the irrigated pastures. Irrigated areas with finer textured soils in this land-type have more wetland type and pasture plant species than sandy soils with a high percent of rock fragments.

South Valley Unit

Water holding capacity differs between soils in the South Valley Unit. In these un-irrigated soils the importance of ground cover and availability of biomass for incorporation into the soil for nutrient cycling and moisture retention is especially important for keeping soils in place and maintaining plant vigor.

Antelope Flat 2 (AF2) – These soils, in the northeastern portion of the South Valley Unit, have formed in the Hillard Shale (Mancos Shale). They are typically clayey and have low permeability with rapid surface runoff. Soils are usually deep and the depth of the clayey material varies over the sandy, cobbly pediment material. These soils are calcareous and sometimes have gypsum concentrations.

North Flank 3 (NF3) – The valley fill is from the Morrison and Curtis formations. It is found between the strike valleys. Soils are typically deep fine-grained clays with some lenses of sand. There is a low percentage of coarse fragments.

North Flank 4 (NF4) – These soils have formed in fine grained alluviums from shales, mudstones, and sandstones of the Morrison, Dakota, and Frontier formations. They tend to be very clayey or silty and form erosive areas of badlands with low vegetative cover. They also

tend to have high concentrations of calcium carbonate, and in some areas gypsum.

North Flank 15 (NF15) – This land type consists of sandstone outcrop, and loose sandy soils. This land-type appears to have the lowest vegetative ground cover with a small percentage of organic material in the grass/forb vegetation component.

North Flank 70's (NF70C,E,L) – Soils are loamy at the surface and become increasingly clayey with depth, also more calcareous. Coarse fragments are limestone.

3. ENVIRONMENTAL CONSEQUENCES (Soil)

a. Alternative 1 - Maintain Current Grazing (No Action Alternative)

1. Direct and Indirect Effects – Linwood Unit - No change to the soil resource from current condition. Ground cover with vegetation is adequate where the area is irrigated. Some saturated areas may become rutted and compacted with heavy livestock use. There is no irreversible soil damage and the Region 4 Soil Quality Standards are being met or less than or equal to 15 percent detrimental soil disturbance.

South Valley Unit – No change to the soil resource as grazing would occur during November – December when soils are typically frozen. Grazing during this time period also has little effect on grazed herbaceous vegetation, maintaining the plant to provide ground cover. Loose soils will continue to move in areas with low ground cover, vegetation, and litter. Biomass for incorporation into the soil for nutrient cycling is lacking in some areas with sandy soils and low ground cover. Detrimental soil disturbance is less than or equal to 15 percent of the allotment area.

2. Cumulative Effects – Besides the cumulative effects documented in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*, the actions proposed in Alternative 1 would have no additional cumulative effects that would affect the overall condition of soils within the allotment. These include any past, present, or reasonably foreseeable activities that may occur.

b. Alternative 2 – No Grazing

1. Direct and Indirect Effects – Linwood Unit - Vegetative ground cover would improve and wet disturbed areas of livestock concentration would recover. Eliminating livestock soil disturbance would favor managed pasture vegetation.

South Valley Unit – Ground cover is expected to increase. This would improve soil condition such as nutrient cycling, moisture retention, and micro-sites for new plants.

2. Cumulative Effects – Besides the cumulative effects documented in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*, the actions proposed in Alternative 2 would have no additional cumulative effects that would affect the overall condition of soils within the allotment. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

c. Alternative 3 – Maintain fall grazing on the South Valley Unit as currently managed, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – Linwood Unit – Decreasing animal unit months (AUMs), grazing season, and better water distribution on the allotment should improve managed pasture species and lessen impacts to the soil in areas of concentrated livestock use. Detrimental soil disturbance is less than or equal to 15 percent of the allotment area.

South Valley Unit - No change to the soil resource as the grazing would continue after plants had finished growing. Loose soils would continue to move in areas with low ground cover, vegetation, and litter. Biomass for incorporation into the soil for nutrient cycling is lacking in some areas with sandy soils and low ground cover. Detrimental soil disturbance is less than or equal to 15 percent of the allotment area.

2. Cumulative Effects – Besides the cumulative effects documented in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*, the actions proposed in Alternative 3 would have no additional cumulative effects that would affect the overall condition of soils within the allotment. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

d. Alternative 4 – Change grazing in the South Valley Unit from fall/winter to spring/summer to maximize browse production, and change grazing numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – Linwood Unit – Decreasing AUMs, grazing season, and better water distribution on the allotment should improve managed pasture species and lessen impacts to the soil in areas of concentrated livestock use. Detrimental soil disturbance is less than or equal to 15 percent of the allotment area.

South Valley Unit – Areas with loose sandy soils and low ground cover are expected to increase and the small areas already in a disturbed condition are also expected to increase. Plant diversity is also expected to decrease with selection of grasses and forbs by cattle in the spring. This would create more bare ground between shrubs. There would be an increase in soil movement either by wind and water. There were large amounts of soil movement in this allotment during the big rain and hail event in June of 2001. It is expected that this alternative, over time, would increase areas of bare soil and move other marginal areas closer to this condition.

2. Cumulative Effects – Of the four alternatives, this alternative is expected to result in the greatest level of negative impacts soils when considered at the cumulative effects scale. Because this alternative requires more intensive grazing of the South Valley Unit, this grazing alternative is expected to potentially increase soil erosion due to the erosive nature of the soils in the South Valley Unit and potential lack of cattle distribution due to lack of water in the spring/summer. Off highway vehicle (OHV) would also cumulatively add to soil erosion.

Besides the potential for erosion in the South Valley Unit and including the cumulative effects documented in *Section A. Past, Present, and Reasonably Foreseeable Activities on page 21*, the

actions proposed in Alternative 4 will have no additional cumulative effects that will affect the overall condition of soils within the allotment. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

D. HYDROLOGY

1. ANALYSIS AREA

The Linwood South-Valley Allotment falls mostly within the Henry's Fork-Flaming Gorge watershed (HUC 6 codes as revised for Utah in 2002): 14040106040 totaling 32,953 acres. This watershed area was used to evaluate cumulative effects (see Map 1 in Appendix A).

2. EXISTING CONDITION/AFFECTED ENVIRONMENT

The three principle water resources on these allotments are:

Linwood Unit – In Birch Spring Draw, only the last 0.2 miles of this waterway is on the Linwood Unit before it flows into Flaming Gorge Reservoir. This waterway has been classified by the State of Utah for beneficial uses as 2B (secondary contact recreation), 3C (non-game fish and other aquatic life), and 4 (irrigation).

South Valley Unit – South Valley Creek (Peoples Canal) is a low flow perennial stream (1 cubic foot per second) that drains into Flaming Gorge Reservoir. This waterway has been classified by the state of Utah for beneficial uses as 2B (secondary contact recreation), 3A (cold water biota), and 4 (irrigation).

Finch Draw is an intermittent/ephemeral stream whose entire length is within the South Valley Unit. This waterway has been classified by the state of Utah for beneficial uses as 2B (secondary contact recreation), 3A (cold water biota), and 4 (irrigation).

Hydrologic Analysis

Birch Spring Draw – Data have been collected on Birch Spring Draw in the vicinity of the Linwood Unit. The stream lies in the middle of a very broad valley (approximately 2.7 miles wide), and has a gradient of ~1% (valley type VIII, by Rosgen classification). The channel is comprised of pools, runs, and riffles. According to the Rosgen classification system, this is a C6 type stream. Channel substrate materials are similar to the surrounding valley fill materials, consisting of fine-grain silt and shale, and sand. Such soft substrate material is easily erosive, and prone to sloughing and down cutting. Currently, due to low reservoir levels, down cutting is occurring, and will continue to occur until reservoir levels rise again. Stream banks are moderately well vegetated with riparian species such as grasses and forbes in the lower reaches (0 to 800 feet upstream of the reservoir), and upland species in the higher reaches (800 to 1,200 feet above reservoir). Upstream, the stream runs through private land characterized by irrigated pasture grasses. Large woody riparian species such as cottonwoods and willows are limited within the area.

The water quality of Birch Spring Draw has been monitored since July 2000. The sampling/monitoring site is located just inside the Flaming Gorge National Recreation Area

boundary. Ashley National Forest personnel performed sampling, and the samples were analyzed at the Utah state labs. Several exceedences of state standards have been consistent in Birch Spring Draw during the last two years of sampling. These exceedences were found in nitrogen, phosphorus, selenium, and total dissolved solids. The high values of nitrogen and phosphorus are to be expected due to the fact that Birch Spring Draw runs through more than 10 miles of private, irrigated farm/grazing lands. The excessive amounts of selenium and total dissolved solids are attributed to the soils through which this stream flows. Poor water quality and soil conditions contribute to the lack of large woody riparian species within this drainage.

There is one reported exceedence of aluminum (August 1, 2001). Since all the other samples for aluminum have been below detectable limits, it is most likely that this number is probably erroneous.

Due to logistical restraints, water from Birch Spring Draw has not been tested for coliform. As new logistically feasible coliform analysis techniques are approved, it is hoped that such testing will be implemented.

Wetlands - In one portion (approximately 3 acres) of the Linwood pasture, some wetland vegetation is the dominant vegetation type. A wetlands delineation study was performed following the U.S. Army Corps of Engineers Wetland Delineation Manual (see wetlands delineation report). It was determined that these wetlands are the result of human-induced change in the hydrology that caused the area to become significantly wetter. Although this area could be characterized as a wetland because of the vegetation, it does not satisfy the requirements of the U.S. Army Corps of Engineers requirement of a wetland. Therefore, no wetlands were identified within the project area.

South Valley Creek – Very little data has been collected on South Valley Creek in the vicinity of the South Valley Unit. The stream lies in the middle of a very broad valley (approximately one mile wide), and has a gradient of ~1% (valley type VIII, by Rosgen classification). The channel is comprised of pools, runs, and riffles. According to the Rosgen classification system, this is a C6 type stream. Channel substrate materials are similar to the surrounding valley fill materials, consisting of fine-grain silt and shale, and sand. Such soft substrate material is easily erosive, and prone to sloughing and down cutting.

Water quality data have not been collected for South Valley Creek. Since South Valley Creek is morphologically similar to Birch Spring Draw, and runs through six miles of private irrigated farm/grazing lands, it is likely it will have the same water quality characteristics as Birch Springs Draw.

Finch Draw – Very little data has been collected on Finch Draw in the vicinity of the South Valley unit. The stream lies on the north side of a steep ridge and has a gradient of ~36% (valley type I, by Rosgen classification). The channel is ephemeral, but when running would consist of pools, runs, and riffles. According to the Rosgen classification system, this is an A4 type stream. Channel substrate materials are similar to the surrounding materials, consisting of cobble, boulders and bedrock. Stream banks are moderately well vegetated with upland species in the higher reaches.

Water quality data have not been collected for Finch Draw.

3. ENVIRONMENTAL CONSEQUENCES (Hydrology)

a. Effects Common To All Alternatives

There are some effects that are common to all alternatives. Birch Spring Draw and South Valley (Peoples Canal) has exceeded state water quality standards for quite some time. All of the alternatives would have the same “no effect” on this condition because of the limited amount of stream within the allotment. For the same reason the amount of fecal coliform entering Flaming Gorge Reservoir would remain virtually unchanged in all of the alternatives also. Sloughing and channel down cutting in areas below the reservoir high water level would continue with or without grazing.

Executive Order 11988, Floodplain Management, requires an agency to evaluate the effect any action may take on a floodplain, including alternatives to avoid adverse effects and minimize potential harm to a floodplain. This is being accomplished through the NEPA process. For Executive Order 11990, Protection of Wetlands, the agency is directed to minimize the destruction, loss, or degradation of wetlands, and to preserve the natural and beneficial values of wetlands. As explained in the previous section, there have been no wetlands (as defined by the U.S. Army Corps of Engineers Wetlands Delineation Manual) identified within the allotment area. Therefore, all of the proposed alternatives are compliant with Executive Orders 11988 and 11990.

b. Alternative 1 – Maintain Current Grazing (No Action Alternative)

1. Direct and Indirect Effects – Alternative 1 would not directly or indirectly cause any major negative effects to the water resources described above.

In the Linwood Unit, livestock grazing is unlikely to affect the water resource of either Birch Spring Draw or Flaming Gorge Reservoir. As can be seen from the water quality data, Birch Spring Draw exceeds state standards before it enters the NRA. This is due to both natural causes and farming/grazing practices upstream, and would not be affected by the presence or absence of ungulate grazing on the Linwood Unit. The same rationale applies to the question of coliform contamination. Any fecal coliform contributed to Flaming Gorge Reservoir in the Linwood Unit would be negligible compared to that contributed by upstream sources. The length of Birch Spring Draw in the Linwood Unit is less than 2% of the total length, while the farmed/grazed length on private land is approximately 60% of the total length.

Overall, Birch Spring Draw contributes less than 0.1% of the total volume of Flaming Gorge Reservoir. It would require unrealistically high concentrations of any pollutant in Birch Spring Draw to extensively affect the water quality of Flaming Gorge Reservoir.

In terms of channel and streambank stability, and the development of favorable aquatic/riparian conditions, spring and fall/winter cattle grazing within the 0.2-mile portion of Birch Springs Draw that lies within the allotment would not contribute to improved conditions. However, the

development of improved aquatic/riparian conditions is probably more a function of finely textured soil conditions (clay) and poor water quality as it enters the allotment rather than livestock grazing practices. These conditions may not allow the development of some riparian species, especially cottonwoods and willows and other large woody riparian species. This is indicated by similar failures in attempting to establish improved aquatic/riparian conditions both within the existing enclosure where livestock grazing has been excluded (refer to Map 3 in Appendix A) and outside the enclosure where livestock grazing does occur.

Streambank conditions within this area would be unaffected by spring and fall/winter livestock grazing except for a single area where cattle cross the stream (~40 feet). This area would continue to be affected by spring and fall/winter grazing, which would continue to result in a shallow channel and poor streambank development.

Currently there is headward erosion, down cutting and stream bank erosion occurring as a result of lower reservoir levels. Grazing could exacerbate erosion below high water reservoir areas, but any long-term damage would be negligible since it would be covered with water (and redeposited) when the reservoir is at full pool again.

In the South Valley Unit, the areas of grazing concentration are far removed from Finch Draw. Furthermore, since Finch Draw is an ephemeral stream lacking riparian vegetation, damage to any wetland/riparian zones is extremely unlikely. While grazing may occur in the vicinity of South Valley Creek, cattle do not cross this stream and have little effect upon aquatic/riparian conditions.

2. Cumulative Effects – Before entering the allotment, Birch Spring Draw runs through 10 miles of private farming/ranching land. Thus it is important to note that most of the water resources within the allotment are greatly affected by the private property through which they flow, therefore, actions proposed in Alternative 1 would have no effects that would add to the overall cumulative condition of the water resources. This includes any past, present, or reasonably foreseeable future activities, both within the allotment and on the private land.

c. Alternative 2 – No Grazing

1. Direct and Indirect Effects – Alternative 2 would not directly or indirectly cause any change to the water resources described above. As mentioned in Alternative 1, Birch Spring Draw does exceed state water quality standards for various contaminants. The absence of livestock grazing on this allotment would have no major effects on the water quality of Birch Spring Draw, South Valley Creek, Finch Draw, or Flaming Gorge Reservoir.

In terms of channel and streambank stability, and the development of favorable aquatic/riparian conditions, the absence of livestock grazing within the 0.2-mile portion of Birch Springs Draw that lies within the allotment would contribute to improved conditions. However, the development of improved aquatic/riparian conditions is probably more a function of finely textured soil conditions (clay) and poor water quality as it enters the allotment rather than livestock grazing practices. These conditions may not allow the development of some riparian species, especially cottonwoods and willows and other large woody riparian species. This is

indicated by similar failures in attempting to establish improved aquatic/riparian conditions both within the existing enclosure where livestock grazing has been excluded (refer to Map 2 and 4) and outside the enclosure where livestock grazing does occur.

Streambank conditions within the 40-foot area where cattle cross Birch Springs Draw would be improved. Areas below the reservoir high water level would continue to show headward erosion, down cutting and stream bank erosion which would eventually be covered with water (and re-deposited) when the reservoir is at full pool again.

The lack of livestock grazing within the South Valley Unit would not result in any changes in water quality and/or aquatic/riparian development since Finch Draw is an ephemeral stream lacking riparian vegetation and livestock effects to South Valley Creek (Peoples Canal) are limited.

2. Cumulative Effects – Before entering the allotment, Birch Spring Draw runs through 10 miles of private farming/ranching land. Thus it is important to note that most of the water resources within the allotment are greatly affected by the private property through which they flow, therefore, actions proposed in Alternative 2 would have no effects that would add to the overall cumulative condition of the water resources. This includes any past, present, or reasonably foreseeable future activities, both within the allotment and on the private land.

d. Alternative 3 – Maintain fall grazing on the South Valley Unit as currently managed, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – In the Linwood Unit, reduced levels of livestock grazing is unlikely to affect the water resource of either Birch Spring Draw or Flaming Gorge Reservoir. As can be seen from the water quality data, Birch Spring Draw exceeds state standards before it enters the Flaming Gorge NRA. This is due to both natural causes and farming/grazing practices upstream, and would not be affected by the presence or absence of ungulate grazing on the Linwood Unit. The same rationale applies to the question of coliform contamination. Any fecal coliform contributed to Flaming Gorge Reservoir in the Linwood Unit would be negligible compared to that contributed by upstream sources. The length of Birch Spring Draw in the Linwood Unit is less than 2% of the total length, while the farmed/grazed length on private land is approximately 60% of the total length.

In terms of channel and streambank stability, and the development of favorable aquatic/riparian conditions, reduced levels of livestock grazing once a year within the 0.2-mile portion of Birch Springs Draw that lies within the allotment would contribute to improved conditions. This would allow for some increase in riparian grass, carex, and sedge species to become established, especially in the 40-foot cattle crossing area. Since the development of improved aquatic/riparian conditions is probably more a function of finely textured soil conditions (clay) and poor water quality as it enters the allotment rather than livestock grazing practices, this alternative would not be expected to change these conditions. The development of cottonwoods and willows and other large woody riparian species would not be expected.

Headward erosion, down cutting and streambank erosion occurring as a result of lower reservoir levels would continue. Grazing could exacerbate erosion in below high water reservoir areas, but any long-term damage would be negligible since it would be covered with water (and redeposited) when the reservoir is at full pool again.

In the South Valley Unit, the areas of grazing concentration are far removed from Finch Draw. Furthermore, since Finch Draw is an ephemeral stream lacking riparian vegetation, damage to any wetland/riparian zones is extremely unlikely. While grazing may occur in the vicinity of South Valley Creek, cattle do not cross this stream and have little effect upon aquatic/riparian conditions.

2. Cumulative Effects – Before entering the allotment, Birch Spring Draw runs through 10 miles of private farming/ranching land. Thus it is important to note that most of the water resources within the allotment are greatly affected by the private property through which they flow, therefore, actions proposed in Alternative 3 would have no effects that would add to the overall cumulative condition of the water resources. This includes any past, present, or reasonably foreseeable future activities, both within the allotment and on the private land.

e. Alternative 4 – Change grazing in the South Valley Unit from fall/winter to spring/summer to maximize browse production, and change grazing numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – There would be no change from Alternative 3 in water quality and all other water resources for the Linwood Unit. However, changing the timing of livestock grazing within the South Valley Unit from fall/winter to spring could result in an increased potential for erosion in localized areas of concentrated livestock use, potentially affecting watershed conditions. Any decrease in herbaceous ground cover would result in increased erosion and have a negative effect upon the watershed. Since there are no available livestock watering sources within the South Valley Unit except for Flaming Gorge Reservoir and a well on private lands adjacent to the allotment, localized areas of concentrated livestock use would be expected with this alternative. The availability of livestock watering sources is not so critical during a fall/winter grazing season since temperatures are cooler and snow is generally available to lessen the need for open water.

2. Cumulative Effects – Before entering the allotment, Birch Spring Draw runs through 10 miles of private farming/ranching land. Thus it is important to note that most of the water resources within the allotment are greatly affected by the private property through which they flow, therefore, actions proposed in Alternative 4 would have no effects that would add to the overall cumulative condition of the water resources. This includes any past, present, or reasonably foreseeable future activities, both within the allotment and on the private land.

E. FISHERIES AND OTHER AQUATIC SPECIES

1. ANALYSIS AREA

The Linwood South-Valley Allotment falls mostly within the Henry's Fork-Flaming Gorge 6th code watershed totaling 32,953 acres. This specific watershed was chosen for the site-specific

fisheries analysis and associated cumulative effects since it contains perennial water and borders Flaming Gorge Reservoir (see Map 1 in Appendix A).

2. EXISTING CONDITION/AFFECTED ENVIRONMENT

Fisheries – Two perennial streams/canals and one large reservoir exist within or adjacent to the Linwood-South Valley Allotment. Birch Spring Draw and the Peoples Canal maintain very low flows for most of winter until irrigation diversions add to their respective discharge. High amounts of dissolved solids exist in both drainages and do not provide conducive fisheries habitat as described above. Although local residents have reported seeing rainbow trout (*Oncorhynchus mykiss*) and kokanee salmon (*Oncorhynchus nerka*) in both Birch Spring Draw and the Peoples Canal, electrofishing surveys conducted on Forest Service administered waters in May 2003 failed to document any species of fish. Only small segments of both streams (0.2 miles of Birch Springs Draw and less than 0.1 miles of Peoples Canal) lie within the allotment at reservoir capacity elevation of 6,040 feet. Both drainages may in fact contain fish higher up stream on private land, but permission to survey these reaches was not obtained.

Both streams are tributaries to Flaming Gorge Reservoir, a very important recreational sport fishery of both Utah and Wyoming. Within this reservoir the only native fish that has been sampled in recent years is the flannemouth sucker. Genetic introgression with non-native white suckers is slowly taking its toll on flannemouths. Other native fishes that have been documented within the reservoir but not sampled recently include: Colorado River pikeminnow (endangered) and Colorado River cutthroat trout (U.S. Forest Service sensitive). Three other native/endangered species native to the Colorado River drainage include the humpback chub, bonytail, and the razorback sucker. Although these species may have been present prior to dam construction, the reservoir does not provide conducive habitat. Although Colorado River cutthroat trout (CRCT) have not been sampled in the reservoir by either Utah or Wyoming in recent years, it is possible that a small population of adfluvial CRCT may exist. However this is very unlikely, as the Utah Division of Wildlife Resources (UDWR) has not collected a single individual since the early 1970s. Historically, spring spawning runs of CRCT would take place in all the major tributaries of Flaming Gorge. However this has not been observed since the early 1970s (Crosby, personal communication, UDWR).

Colorado River cutthroat trout (CRCT) are the only native trout found on the Ashley National Forest (which includes portions of Utah and Wyoming). Cutthroat trout were distributed in all suitable waters of the basin when Europeans reached the region (Behnke 1992). Currently, CRCT exist only within fragmented components of their historical range. Colorado River cutthroat trout are currently listed as a “sensitive species” by the U.S. Forest Service Intermountain Region and are listed as an aquatic management indicator species (MIS) in the Forest Plan. Colorado River cutthroat trout have recently been petitioned for federal listing as a threatened species under the Endangered Species Act of 1973. The U.S. Fish and Wildlife Service (USFWS) will review the petition to determine if further consideration is warranted and eventually rule if CRCT should be listed as a threatened species under the Endangered Species Act. Populations of “pure” CRCT are located on both the south and north slopes of the Uinta Mountain Range.

Cutthroat trout generally spawn in the clear, cold, shallow riffles of small streams in the mid to late spring. Spawning initiation is influenced by water temperature, runoff, ice melt, elevation, and latitude (Hickman and Raleigh 1982). Male cutthroat trout in some populations mature at ages two or three, with females maturing a year later (Hickman and Raleigh 1982). Because of the relatively high post-spawning mortality, some individuals may spawn only once (Sigler 1996).

Stream habitat most advantageous to cutthroat trout is characterized by clear, cold, silt-free water with rocky substrate and riffle: pool ratios of 1:1 (Hickman and Raleigh 1982; Sigler 1996). Colorado River cutthroat trout normally prefer summer water temperatures of about 59 degrees Fahrenheit, but are resilient up to a lethal threshold of 70 degrees Fahrenheit (Hickman and Raleigh 1982). Areas occupied by cutthroat trout range in elevation from 3,300 to 11,500 feet (1,000 to 3,500 meters) (Kershner 1995).

Successful implementation of the Colorado River cutthroat trout (CRCT) Conservation Agreement and Strategy by the Utah Division of Wildlife Resources (UDWR) and the Ashley National Forest has led to an upward trend for CRCT in several lakes on the south slope of the Uinta Mountains of the Ashley National Forest. Stream populations of CRCT still remain at risk and are on a downward trend Forest wide primarily due to non-native fish competition and hybridization. Historical grazing, roads, habitat fragmentation, and timber practices may also play a role depending upon the location. The subspecies appears to be distributed throughout much of the Forest, but populations vary in different streams and stream reaches. It appears that some populations are thriving in isolated streams or stream reaches. Many populations have been replaced by non-native fish species. However, with continued planned conservation actions for stream populations as outlined in the Conservation Strategy, and upward trend could be achieved within 5-7 years on the Ashley National Forest. The UDWR and Ashley National Forest continue to better define fish distribution through ongoing surveys.

The upward trend for lake populations is largely attributed to the development of a CRCT broodstock program. For example, a healthy and very productive Colorado River cutthroat trout (CRCT) broodstock population exists in Sheep Creek Lake. For the past 5 years (1999-2003), thousands of fingerlings from this source have been stocked in several Uinta Mountain lakes across the south slope of the Uintas. The Utah Division of Wildlife Resource's 2001 monitoring effort indicates that 14 of the 62 stocked lakes in 1999 and 2000 exhibit a good potential for full establishment. The continued success of this current trend will be dependent upon future stocking.

In addition to the Sheep Creek Lake broodstock program, two other broodstock programs were recently initiated on the Forest. The Lake Canyon Lake broodstock program located on the south unit was started in 2002 and is scheduled to be ready for stockables in 2006. The third broodstock source, which will be used to supplement CRCT populations on the north slope of the Uintas, also resides in Sheep Creek Lake and is also scheduled for stockables in 2006.

The Forest Service and UDWR are also actively engaged in habitat protection through various activities such as constructing migration barriers to protect reclaimed streams. Along with the fish barriers, new construction and maintenance of riparian fencing has taken place to protect

riparian vegetation and streambanks from cattle grazing. In addition, improvements to existing roads such as culvert replacement and reshaping of roads, has occurred to reduce sediment loading in streams. Paramount to the CRCT stream effort is UDWRs lead role in an interagency effort for mechanical and chemical removal of non-native trout to provide non-competitive additional habitat for CRCT.

Other Aquatic Species

Macroinvertebrates (MIS) – Qualitative samples were collected at four sites along Birch Spring Draw and the Peoples Canal where they pass through Forest Service administered lands. Drift/kick nets were used at each site and individual macroinvertebrates were identified to the family level. Populations of families indicative of high water quality, including; mayflies, stoneflies and caddis flies were not found to be present. High concentrations of families associated with degraded water quality were found. These were sampled entirely in sedimentary habitats and included midge fly larvae and other worm species.

Forest-wide macroinvertebrates populations have been monitored on the Ashley National Forest since the early 1980s. The forest wide trend for macroinvertebrates has been steady for the past 20 plus years with an average Biotic Condition Factor (BCI) that exceeds 75, which is the minimum value to manage for on the Ashley National Forest. The genera identified in the Forest Plan, (Mayflies) *Epeorus ssp.*, *Ephemerella doddsi*, *Ephemerella inermis*, (Stoneflies) *Zapada spp.*, and the True fly family Chironomidae are all widespread and common on the Forest.

3. ENVIRONMENTAL CONSEQUENCES (Fisheries and other Aquatic Species)

a. Effects Common To All Alternatives – The minimal amount of fluvial waters contained within the Linwood-South Valley Allotment (0.2 miles of Birch Springs Draw and less than 0.1 mile of Peoples Canal) do not contain individual CRCT or habitat to support any species of salmonid. Other species of fish such as carp and white suckers may be able to inhabit these tributaries to Flaming Gorge Reservoir, but would not persist or recruit offspring due to poor water quality conditions. These tributaries are affected by actions/practices that take place higher up in the watershed and canal system and from private land. These practices include but are not limited to agricultural fertilization, livestock feeding/grazing and flood irrigation.

1. Direct and Indirect Effects – Under all alternatives no negative effects to any fish, fish habitat, macroinvertebrate assemblages or lentic habitat in Flaming Gorge Reservoir, Birch Spring's Draw or the People's Canal would occur.

2. Cumulative Effects – Under all alternatives, and in consideration of the activities discussed in *Section A. Past, Present, and Reasonably Foreseeable Activities*, there are no past, present, or reasonably foreseeable activities that would cumulatively affect any fish, fish habitat, lentic habitat or aquatic macroinvertebrate assemblages in Flaming Gorge Reservoir, Birch Spring's Draw or the People's Canal. This is due to the high amounts of dissolved solids accumulating from flowing through about 10 miles of private land, and the very low flows inherent in both drainages.

F. WILDLIFE

1. ANALYSIS AREA

The Linwood South-Valley Allotment falls mostly within the Henry's Fork-Flaming Gorge 6th code watershed totaling 32,953 acres (see Map 1 in Appendix A). Approximately 691 acres (2%) of the 3,680 acres on the Linwood-South Valley Allotment fall within an adjoining watershed, and are located along a rocky bluff bordering the Flaming Gorge Reservoir with limited access to cattle. The combined watershed area was used to evaluate cumulative effects for wildlife. Total National Forest acres within the watershed area are approximately 7,812 acres. Correcting for the 691 acres of the allotment within the adjoining watershed, the Linwood South Valley Allotment represent about 9.0% of the cumulative effects area. Of this area, the Linwood Unit represents approximately 0.5%, and the South Valley Unit represents about 8.5% of the watershed area.

2. EXISTING CONDITION/AFFECTED ENVIRONMENT

The Linwood-South Valley Allotment is approximately 3,683 acres in size and is divided into two pastures of uneven size. Each pasture has a different grazing system and results in different intensities of use by livestock. The current grazing system allows up to 360 head of cattle on the Linwood Unit annually. The Linwood Unit is approximately 166 acres and is made up of primarily irrigated pasture bordering the Flaming Gorge Reservoir. Currently, cattle graze this Unit from May 1 to June 1 and again from October 15 to November 15. The South Valley Unit is about 3,517 acres and is made up primarily of pinyon/juniper woodlands and sagebrush vegetation types. This pasture is grazed with 301 head of cattle from November 15 to December 15. The allotment also includes a riparian exclosure (less than 5 acres) and the Linwood pond exclosure (31 acres). Both of these areas are excluded from grazing and are located within the Linwood Unit.

Major vegetation types within the allotment include pinyon pine/juniper woodlands, Wyoming big sagebrush, curl-leaf mountain mahogany, and irrigated pasture. Pinyon/juniper woodlands in the allotment are primarily old mature stands.

Structural stage distributions for pinyon/juniper types within the allotment are within expected ranges for xeric woodlands in the area. However, increasing canopy closure by younger trees is evident within mature or old growth stands and encroaching into sagebrush and curl-leaf mountain mahogany types (Table 3).

TABLE 3. Structural Stage Distribution of Pinyon/juniper Types on the Allotment.

Structural Stage	Root Collar Diameter	Canopy Cover	Acres	% of Pinyon/Juniper Types
3A	2-6 inches	0-25%	12.7	0.7
4A	6-12 inches	0-25%	147.6	7.7
4B	6-12 inches	25 –50%	169.0	8.8
4C	6-12 inches	>50%	487.4	25.4
5A	12+ inches	0-25%	430.4	22.4
5B	12+ inches	25 –50%	674.4	35.1

Irrigated meadows in the Linwood Unit are declining due to a combination of intense grazing and reduced irrigation capacity associated with deteriorating condition of existing irrigation ditches. Field surveys suggest that the productivity of the irrigated pastures have declined over the last several years. An abundance of water in some portions of the fields is creating pockets of cattails and wetland type species, while lack of water in other areas is allowing these to revert to annual plants or native pasture.

High intensity fall and spring grazing in the Linwood Unit currently leaves little residual ground cover outside of the Linwood Pond enclosure. This limits wildlife use outside of the Linwood Pond enclosure to those species tolerant of low ground cover. Geese readily utilize grazed areas close to open water for foraging during spring and fall migrations, but successful waterfowl nesting is not expected on grazed portions of the Linwood Unit due to lack of adequate cover and the early onset of spring grazing. Canada geese appear to be some of the earliest nesters in the area, with most broods moving into ponds and Linwood Bay by the end of May.

The Linwood Pond enclosure (31 acres) has not been grazed for approximately five years and currently provides quality hiding and nesting cover for waterfowl and other wildlife species. Vegetation accumulations in this area have helped to increase the complexity and structure of ground cover habitat for wildlife species.

Waterfowl and shore birds known or expected based on habitat types occurring in the Linwood Unit or adjoining habitats include Canada geese, eared grebes, gadwalls, mallards, cinnamon teal, northern shovelers, pintails, killdeer, and spotted sandpipers. Some of these species have been recorded nesting in the Henry's Fork Wetland bordering the Linwood Unit to the north. Other species like tundra swans, willets, and phalaropes have only been observed during spring and fall migrations.

The South Valley Unit differs extensively from the Linwood Unit in two ways. It is comprised primarily of xeric vegetation types, and it is grazed only once a year in late fall/early winter. This grazing rotation has been in effect since 1976. This grazing rotation allows maturation of grass and forb plant species and avoids livestock disturbance to ground nesting species. Late fall grazing with cattle also minimizes grazing impacts to grassland types on this unit.


Fall grazing on the South Valley Unit improves cattle distribution across the unit and thereby minimizes the number and size of high use areas. The rugged terrain and limited water availability ensure that many areas within the Unit receive little or no use by cattle, particularly in years with early snow accumulations. Some trampling damage to sagebrush plants was noted during field surveys, but only around gates or other constriction points. Otherwise, livestock effects are hard to discern except for subtle changes in plant composition.

Some clubbing and hedging is evident on shrub species found in the South Valley Unit. The greatest level of hedging was apparent on mahogany and sagebrush types that remain snow free throughout the winter, with most of the hedging corresponding to winter use by big game

species. Ocular surveys of the unit suggest that current grazing on this unit is compatible with both winter range and ground nesting bird habitat requirements.

Antelope and bighorn sheep are common big game species encountered on the allotment, and will be generally be referred to as big game species throughout the remainder of this document. Bighorn sheep use on the allotment has been occurring in recent years and is largely limited to the rocky cliffs on the eastern boundary of the South Valley Unit, which are generally unsuitable for livestock. Antelope use occurs infrequently and is limited to isolated individuals or small groups totaling less than 10 individuals. Overall, browse habitats on the allotment are in good to fair condition, but heavy hedging is apparent on most mahogany types in windblown areas. This negatively impacts mule deer and bighorn sheep, which tend to rely on these shrubs during high snow years. Increasing tree densities in juniper vegetation types are also a concern for big game habitat management since increased densities result in a corresponding decrease in understory production of many shade intolerant species important to big game species. High tree densities also reduce habitat suitability for bighorn sheep by decreasing sight distances preferred for predator avoidance (Smith 1992, Greenwood et al. 1999).

FEDERALLY THREATENED, ENDANGERED, AND PROPOSED SPECIES

Threatened, endangered, and proposed species with suitable habitat in the project area include the bald eagle. Black-footed ferret habitat is also discussed in this section, although suitable black-footed ferret habitat is not found on the allotment. The allotment is not within a Lynx Analysis Unit (LAU). Additional information and references on threatened, endangered, and proposed species can be found in the Biological Assessment prepared for this project (on file at the Flaming Gorge Ranger District Office 

Bald eagle

Bald eagles are known to occur on the Ashley National Forest, primarily near Flaming Gorge Reservoir and the Green River corridor during the winter months (Ashley NF unpub. data). This species is often seen scavenging on carrion along roadways on the District. Bald eagles are common in the winter in the state of Utah and are rare in the summer (Behle 1985). The majority of wintering bald eagles are found near open water, where they feed on fish and waterfowl. Winter habitat must contain an abundant available food supply with one or more night roost sites (Behle 1981).

There are only five active bald eagle nests in the state, two near Moab, one near Orangeville, and one near the west desert. These nests are all more than 100 miles away from the project area (Romin, USF&WS, personal communication 2004). However, another nest has recently been discovered near Manila, Utah (Maxfield, UDWR, personal communication 2004). This nest is located on private land and is about 2.5 miles west of the Linwood-South Valley Allotment. No established roost sites or nest sites are known on the allotment.


Black-footed ferret

Extensive surveys were conducted for black-footed ferrets in the early 1990s but none were located, nor have any been recorded on the Flaming Gorge Ranger District. Open sagebrush and grassland areas on the allotment could provide habitat for the black-footed ferret, and several small white-tailed prairie dog towns (5 to 10 animals) are known to exist on the allotment. Most

of these towns are located in the Linwood Unit, with only a couple of towns observed on the South Valley Unit. However, the small size of the prairie dog groups is below the 264 prairie dogs needed per activity area (180 acres) to support female ferrets (Biggins et al. 1993), therefore this precludes the areas described above as suitable for black-footed ferret habitat. Black-footed ferrets will therefore not be discussed further as an endangered species with suitable habitat in the project analysis area.

FOREST SENSITIVE SPECIES

Forest sensitive species are identified by the Forest Service Regional Forester as ‘those...for which population viability is a concern, as evidenced by...significant current or predicted downward trends in habitat capability that would reduce a species’ existing distribution’ (FSM 2670.5).

Of the species identified as Forest Sensitive species, the American peregrine falcon, northern goshawk (also a management indicator species (MIS)), trumpeter swan, common loon, mountain plover, greater sage-grouse (also an MIS), spotted bat, Townsend’s big-eared bat, and pygmy rabbit are associated with the habitats in or near the project area. Of these species, only the peregrine falcon and trumpeter swan have been recorded in habitats within or adjoining the allotment. Additional information and references on Forest sensitive species can be found in the Biological Evaluation prepared for this project (on file at the Flaming Gorge Ranger District Office .

American peregrine falcon

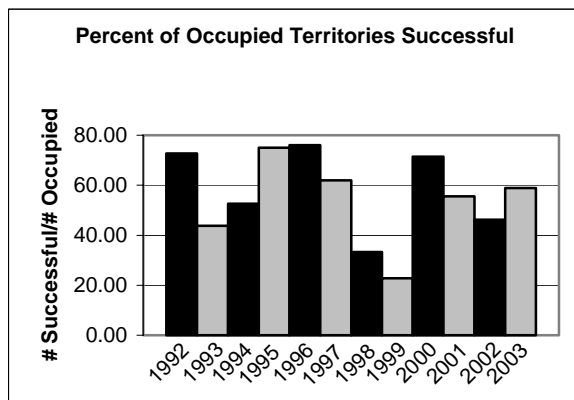
Peregrine falcons have been recorded at locations west and east of the allotment. No nest sites for this species have been recorded on the allotment. Canyon rims and rock ledges along the Flaming Gorge Reservoir and the eastern boundary for the allotment provide suitable nesting habitat for this species. Peregrines have been seen around the Sheep Creek Bay area to the east of the allotment during the breeding season (Maxfield, UDWR, personal communication 2003). Incidental observations of lone peregrines to the west of the allotment suggest that peregrines probably hunt along meadows and the reservoir shoreline within the allotment. The entire project area is potential foraging habitat for peregrine falcons.

Northern goshawk (also MIS)

This species inhabits coniferous, deciduous, and mixed forests in North America and prefers to forage in closed canopy forests with moderate tree densities as compared to young forests (Graham et al. 1999). A goshawk's home range may be up to 6,000 acres and has three main habitat components; nesting, post fledgling area, and foraging area (Reynolds 1992). Nesting areas are typically 30 acres in size and may include more than one nest (Reynolds 1992). The post-fledgling area is 420 acres in size and surrounds the nest area (Reynolds 1992). The post-fledgling area typically includes a variety of forest types and conditions, but it should contain patches of dense trees as well as developed herbaceous areas and shrubby understory, snags, downed logs and small openings (Reynolds 1992). These attributes are needed to provide the necessary habitats for hunting, security and prey species (Reynolds 1992). The foraging area is approximately 5,400 acres and surrounds the post-fledgling area (Reynolds 1992).

Statistical analysis of autumn migratory raptor counts in the Wellsville Mountains of Utah from 1977 to 1979 and 1987 to 2001, showed a decline in counts of northern goshawks. This analysis also suggests that northern goshawk productivity has dropped substantially in portions of northern Utah (Hoffman et al. 2002; Hoffman and Smith 2003). Hoffman et al. (2002) further suggest that the severe drought may be depressing raptor populations, range wide, in the interior west.

The Ashley National Forest annually monitors and surveys known goshawk territories on the Forest (Ashley NF unpub. Data; USDA Forest Service 2003). The graph below depicts the percent of occupied northern goshawk traditional territories that were successful on the Ashley National Forest, between 1992 to 2003 (USDA Forest Service 2003).



The Ashley National Forest has been monitoring northern goshawks since 1991. Of the 13-year total of 236 active nests, 162 (69%) fledged young (USDA Forest Service 2003). The occupancy rate of known territories has fluctuated since data collection began, with an average of 46.9% (USDA Forest Service 2003). Kennedy (1997) evaluated goshawk populations across the west, including the goshawk population on the Ashley National Forest. Kennedy (1997) found no statistical evidence of a decline in the goshawk population on the Forest. Analysis of goshawk data collection on the Forest since Kennedy's study indicates that the population is apparently stable across the Forest (USDA Forest Service 2003, Ashley NF unpub. data). It also appears that the Forest supports a viable goshawk population and continues to provide well-distributed habitat across the Forest.

In Utah, most of the 421 known nests located during project level surveys occur in mid-elevation (6,000 feet) to high-elevation (10,000 feet) sites, which are currently occupied by mature quaking aspen or coniferous forests (Graham et al. 1999). Many of the documented goshawk territories on the Ashley National Forest are associated with lodgepole and aspen cover types (Ashley NF unpub. data). However, some nests in Utah have been documented in the spruce/fir and ponderosa pine types (Graham et al. 1999).

The predominant forest cover type in the project area is pinyon/juniper woodlands. There are no documented goshawk territories in or near the project area. However, given that a goshawks home range may be up to 6,000 acres (Reynolds 1992), an established territory near the allotment boundary is possible. However, a goshawk occurrence within the allotment would

likely be incidental since the necessary forest structure for goshawk habitat is not found in project analysis area, and more suitable habitat is located in other areas on the District. Therefore, since habitat as described above is not present within the analysis area and occurrence is likely to be incidental, this species will not be evaluated further in this document.

Trumpeter swan

Trumpeter swans have been recorded using the Henry's Fork Wetland and Linwood Bay areas during the fall and spring migrations over the last three years (Patla, WG&F, personal communication 2002). These areas adjoin the Linwood Unit to the north, thus making the Linwood Pond and surrounding area possible habitat for this species. However, the small size and shallow depth of the Linwood Pond allow it to freeze early sometimes during the fall and to be partially dry during some springs. These and other physical characteristics of the pond make it unlikely to meet the habitat requirements of this species.

Common loon

Common loons have been reported using the Flaming Gorge Reservoir during spring migrations (Ritter 1989). The Flaming Gorge Reservoir primarily serves as a resting area as loons migrate northward in the spring and southward in the fall. Loons likely do not breed on the Flaming Gorge Reservoir due to fluctuating water levels during the spring, which leaves nest sites and emergent vegetation submerged or well above the water level along the shorelines. Loons are primarily fish eaters, and depend on their vision for pursuing prey under water (McIntyre 1986). The only water body within the allotment is the Linwood Pond. However, the pond is small and shallow, which allows it to freeze or is other times partially dry, preventing the establishment of any fish populations. These and other physical characteristics of the pond make it and the Flaming Gorge Reservoir unlikely to meet the habitat requirements of this species.

Pygmy rabbit

Basin big sagebrush habitats in the South Valley Unit also provide potential habitat for the pygmy rabbit. This species has not been recorded on the allotment, although an unverified sighting of this species was recorded in similar habitats on the eastern side of Flaming Gorge Reservoir (Blatt, USFS, personal communication 2003). Basin big sagebrush is the primary habitat for this species on the allotment and is found in isolated patches along ravines and drainage bottoms in the South Valley Unit.

Mountain plover

Surveys were conducted for mountain plovers in the early 1990s but none were located (Ashley NF unpub. data). The mountain plover has not been recorded on the Flaming Gorge Ranger District and is not expected to occur on the allotment based on previous surveys. Suitable habitat for the mountain plover occurs along the shoreline and short grass habitats bordering the Flaming Gorge Reservoir. In other areas, this species has been associated with prairie dog towns (Knowles 1996; Knowles and Knowles 1984).

Greater sage-grouse (also MIS)

Sagebrush habitats are important for the survival of nesting and wintering greater sage-grouse (Connelly et al. 2000). Summer habitat has been described for adult males (Wallestad and Schladweiler 1974; Ellis et al. 1989), adult females and juveniles (Dunn and Braun 1986),

nesting (Klebenow 1969; Wallestad and Pyrah 1974; Wakkinen 1990), brood rearing (Wallestad 1971; Drut et al. 1994; Sveum et al. 1998), and breeding (Patterson 1952; Gill 1965; Barnett and Crawford 1994). Sage-grouse, are limited to use of sagebrush above the snow for forage and cover during winter (Griner 1939; Patterson 1952; Eng and Schladweiler 1972). Studies describing winter habitat have reported sagebrush canopy cover ranging from 12% in Oregon (Hanf et al. 1994) to 43% in Colorado (Schoenburg 1982). Height of sagebrush in winter use areas ranged between 20 centimeters to 36 centimeters in Colorado (Beck 1977). Topographic distribution of sage-grouse in winter varies depending on snow depth, slope, and aspect (Beck 1977; Hupp and Braun 1989). Sage-grouse have been shown to prefer both Wyoming big sagebrush (Remington and Braun 1985; Myers 1992) and mountain big sagebrush (Welch et al. 1991). Sage-grouse populations can be migratory or non-migratory (Hulet 1983; Connelly et al. 2000). Non-migratory populations are often found in lower elevation habitats (Wallestad 1975) while migratory populations are often found at higher elevations (Dalke et al. 1960; Connelly 1982). Winter movements are not always based on the proximity of suitable winter habitat but apparently on successful traditions within a population (Connelly et al. 1988).

Sagebrush habitats in the South Valley Unit provide habitat for sage-grouse, but leks have not been recorded in this section of the Flaming Gorge Ranger District, nor has this species been recorded on the allotment. Infrequent use however, can be reasonably expected due to known occurrences in other areas of the District. The closest recorded leks are located about 6 miles to the northeast of the allotment. Summary reports for sage-grouse in Utah estimate the sage-grouse breeding population to be about 12,999 birds, and indicate a decline in population trends for the species across the state (UDWR 2002). Daggett County lek counts over the past three years indicate a positive trend for sage-grouse in this area (Maxfield, UDWR, personal communication 2004).

Spotted bat

The spotted bat is found in various habitats and elevations, but most often collected in dry, rough desert terrain (Harvey et al. 1999; Oliver 2000). They roost alone in rock crevices high up on steep cliff faces and are frequently reported near cliffs over open water (Watkins 1977). Spotted bats are territorial and avoid each other while foraging for moths, which are their primary prey species. Distribution on the Ashley National Forest is apparently limited by availability of roosts primarily under loose rock or in crevices in rock cliffs (Perkins 2001). On the south slope of the Uintas, they have been located near steep-walled stream canyons such as Ashley Creek, Black Canyon and Brush Creek (Lengas 1994; Perkins 2001). There was also one location on the South Unit in pinyon/juniper/sage at 7,400 feet (Perkins 2001).

The analysis area has populations of moths and contains open water in the Linwood Pond. There is also cliff habitat and rocky outcrops in the South Valley Unit, which might serve as potential roosting sites within the allotment. In general, these features are essential elements of foraging habitat, however this species has not been located in habitats within the allotment.

Townsend's big-eared bat

Townsend's big-eared bats are found in various habitats and elevations (Harvey et al. 1999), but in Utah primarily found in shrub steppe and pinyon/juniper habitats (Oliver 2000). Big-eared bats need caves or mines for hibernation and maternity roosts, and are often sensitive to

disturbance at these roosts (Kunz and Martin 1982). Occasionally big-eared bats use old buildings (Kunz and Martin 1982). Townsend's big-eared bats have been located in two caves on the Ashley and near Dutch John Draw (Lengas 1996). Limestone Hills, Limestone Plateau and various canyon landtype associations contain most of the suitable habitat on the Ashley, since they have rock formations that likely contain caves. Habitat for this bat is present within the analysis area on the South Valley Unit, but has not been located in habitats within the allotment.

MANAGEMENT INDICATOR SPECIES (MIS)

Management indicator species (MIS) with habitat in the project area include the northern goshawk (also Forest Sensitive), greater sage-grouse (also Forest Sensitive), Lincoln's and song sparrows, golden eagle, mule deer, and elk. Other MIS are not present due to lack of suitable habitat within the project area, or the project area is outside of the known range of the species. These species include the red-naped sapsucker, warbling vireo, and white-tailed ptarmigan.

Northern goshawk

The northern goshawk has also been designated as a Forest Sensitive Species and was previously discussed in the *Forest Sensitive Species* section above, and if mentioned, will be discussed under the same heading throughout the remainder of the document. As discussed above a goshawk occurrence within the allotment would likely be incidental, therefore this species will not be evaluated further in this document.

Greater sage-grouse

The greater sage-grouse has also been designated as a Forest Sensitive Species and was previously discussed in the *Forest Sensitive Species* section above, and will be discussed under the same heading throughout the remainder of the document. Due to suitable habitat occurring on the allotment, effects to this species will be discussed further in this document.

Lincoln's and song sparrows

Lincoln's sparrow and song sparrow are indicators of riparian shrubs. These species are generally found along streams, wet meadows, riparian thickets, and brushy forest edges (NatureServe 2004). They forage on insects and seeds, and nest on the ground in concealing vegetation (NatureServe 2004). Home range for both species is approximately 0.4 hectares (1 acre, or 208 feet by 208 feet). (NatureServe 2004).

Nature Conservancy data shows Lincoln's sparrow populations in Utah to be "vulnerable" (NatureServe 2004). According to data compiled from surveys (including two routes on the Forest) from 1966 to 2002, the North American Breeding Bird Survey (BBS) shows Lincoln's sparrow populations in the state of Utah to have a positive trend (Sauer et al. 2003). Data from the Grizzly Ridge route appear to indicate that Lincoln's sparrow populations are slightly increasing (Sauer et al. 2003). There have been no detections of Lincoln's sparrows on the Moon Lake route (Sauer et al. 2003). Four other BBS routes (Soapstone, Wasatch, Matt Warner Reservoir, and Flaming Gorge routes) are in similar habitats that occur on the Ashley National Forest or are in close proximity to the Forest. The Flaming Gorge and Matt Warner routes did not have any Lincoln's sparrow occurrences, but the Soapstone and Wasatch routes indicate a stable to increasing trend of occurrences of this species (Sauer et al. 2003). The Ashley NF ran

three transects in the riparian canyon type in 1994 and 1995 and detected no Lincoln's sparrows and seven Lincoln's sparrows respectively (Ashley NF unpub. data). Other recorded sightings of Lincoln's sparrows have been distributed across the Forest (Ashley NF unpub. data).

Nature Conservancy data shows song sparrow populations in the state to be "apparently secure" (NatureServe 2004). According to data compiled from surveys (including two routes on the Forest) from 1966 to 2002, the North American Breeding Bird Survey (BBS) shows song sparrow populations in the state of Utah to have a positive trend (Sauer et al. 2003). Data from the Grizzly Ridge and Moon Lake routes appear to indicate a stable to slightly decreasing trend in song sparrow populations (Sauer et al. 2003). The Flaming Gorge and Wasatch routes did not have any song sparrow occurrences, but the Soapstone and Matt Warner routes indicate a stable to increasing trend of occurrences of this species (Sauer et al. 2003). The Forest ran three transects in the riparian canyon type in 1994 and 1995 and detected 120 song sparrows and 47 song sparrows respectively (Ashley NF unpub. data). Other recorded sightings of song sparrows on the Forest are well distributed (Ashley NF unpub. data).

Breeding bird trend information available for this species in Utah and in North America indicate that populations have been increasing since the late 1960s. Based on the available data for the Ashley National Forest and for Utah (Nature Conservancy data, BBS state wide data, BBS data on the Forest and surrounding the Forest, Ashley NF bird transects, and sighting records), it is believed that the Lincoln's sparrow population on the Forest is stable to increasing and the song sparrow population is stable. It is also believed that the Ashley National Forest provides ample riparian shrub habitat (20,700 acres) that is well distributed across the Forest, and sustains viable populations of Lincoln's and song sparrows (Forest Plan 1986).

Limited Lincoln's and song sparrow habitat is present on the Linwood-South Valley Allotment in small amounts of acreage of dispersed woody riparian habitats. Small pockets of possible nesting habitat (less than 1 acre) are found in the Linwood Unit, growing primarily along irrigation ditches and seep areas. Song sparrows have been recorded in willow and tamarisk types found in the Henry's Fork Wetland immediately to the north of the Linwood Unit. Due to suitable habitat occurring on the allotment, effects to this species will be discussed further in this document.

Golden eagle

The golden eagle is an indicator species for cliffs and rocks. Golden eagles require elevated nest sites, primarily cliffs (4,000 feet to 10,000 feet above sea level) that are close to hunting areas, but may also use trees (DeGraaf et al. 1991).

The North American Breeding Bird Survey found golden eagle populations in the state of Utah to have an increasing trend (Sauer et al. 2003). Two of the Breeding Bird Survey (BBS) routes occur on the Ashley National Forest. These are the Moon Lake and the Grizzly Ridge routes. Four other BBS routes (Soapstone, Wasatch, Matt Warner Reservoir, and Flaming Gorge routes) are in similar habitats that occur on the Ashley National Forest or are in close proximity to the Forest (Sauer et al. 2003). The Wasatch and Soapstone routes did not have any golden eagle occurrences, but the Flaming Gorge and Matt Warner routes indicate a stable to increasing trend of occurrences of this species (Sauer et al. 2003). Nature Conservancy data show golden eagle

populations in Utah to be “apparently secure” (NatureServe 2004). Recorded sightings of golden eagles on the Forest appear to be distributed across the Forest with the majority of sightings occurring within the last four years (Ashley NF unpub. data).

Population trends for this species in Utah have been upward since the 1960s (Sauer et al. 2003). They are also considered to be fairly common across the western United States with estimates ranging up to 70,000 birds (Raptor Center website 2003). Based on the available data for the Ashley National Forest and for Utah (Nature Conservancy data, BBS state wide data, BBS data on the Forest and surrounding the Forest, Ashley NF bird transects and sighting records), it is believed that the golden eagle population on the Forest is stable to slightly increasing. The Ashley National Forest provides golden eagle habitat that is well distributed across the Forest that is believed to be sufficient to sustain a viable population of golden eagles (Forest Plan 1986).

A majority of the Linwood-South Valley Allotment is considered as either foraging or nesting habitat for the golden eagle. No nests for this species have been recorded on the allotment, but canyon rims and rock ledges along the Flaming Gorge Reservoir (eastern boundary for the allotment) provide suitable nesting habitat for this species. All vegetation types found on the allotment provide foraging habitat for this species, and it is not uncommon to see this species feeding on carrion along Highway 44. Due to suitable habitat occurring on the allotment, effects to this species will be discussed further in this document.

Mule deer and elk

Mule deer and elk are common big game species encountered on the Linwood-South Valley Allotment. Both mule deer and elk are listed as MIS because of their economic importance as hunted species. Year round mule deer use is evident across the allotment, roughly correlated with sagebrush, mahogany, and juniper vegetation types. Elk habitat within the allotment is primarily winter range.

The Ashley National Forest is located within five of the state of Utah’s wildlife management subunits; (North Slope, Daggett (elk population objective is 1,300 and population estimate is 1,400); South Slope, Vernal (elk population objective is 2,500 and population estimate is 2,600); South Slope, Yellowstone (elk population objective is 5,600 and population estimate is 5,300); Nine Mile, Anthro (elk population objective is 700 and population estimate is 810); and Wasatch Mountains, Avintaquin (elk population objective is 1,000 and population estimate is 1,250) (UDWR 2004). Since there are portions of these subunits that are off the Forest, not all of these animals would occur on the Forest. With the exception of the Yellowstone subunit, the elk population on each of these subunits appears to be on a stable to slightly increasing trend.

Since the Forest constitutes a large portion of these subunits and population objectives have been exceeded or nearly met, it appears that the elk population across the Forest is stable. Based on the available data, it is also believed that the Forest is providing well-distributed habitat that supports a viable population of elk.

Mule deer population objectives and population estimates for the five wildlife management subunits in which the Ashley National Forest occurs are: South Slope, Vernal population

objective is 13,000 and the population estimate is 11,600; South Slope, Yellowstone population objective is 12,000 and the population estimate is 10,400; Wasatch Mountains, Avintaquin population objective is 3,000 and the population estimate is 1,600; North Slope Unit (Daggett is a subunit within this unit) population objective is 12,000 and population estimate is 10,400; and Nine Mile Unit population objective is 8,500 and the population estimate is 3,400. (UDWR 2004)

The estimated deer population is below the population objectives in all of the subunits discussed above. There was a sharp decline of mule deer populations in the state of Utah in the winter of 1992 to 1993. This decline has been attributed to several years of drought followed by an unusually hard winter. The years following the decline, the deer population rebounded slowly. However, due to the current drought, the deer population has again taken a downward trend since 2000. (UDWR Statewide Management Plan for Mule Deer 2003)

The Ashley NF constitutes a large portion of the mule deer wildlife management subunits discussed above, and consequently the overall deer population on the Forest is currently in this same downward trend. The data also suggest, however, that the Forest is providing well-distributed habitat that supports a viable population of mule deer. Due to suitable habitat occurring on the allotment, effects to this species will be discussed further in this document.

Red-naped sapsucker and warbling vireo

Red-naped sapsucker and warbling vireo are management indicators for deciduous woodlands, primarily aspen and riparian cottonwood. These species inhabit deciduous forests, primarily aspen, and deciduous/conifer mix (DeGraaf et al. 1991; Mendin 1990). These habitats are not present within the analysis area.

The North American Breeding Bird Survey found warbling vireo populations in the state of Utah to have an increasing trend and red-naped sapsucker populations to have a decreasing trend (Sauer et al. 2003). Two of the Breeding Bird Survey (BBS) routes occur on the Ashley National Forest. These are the Moon Lake and the Grizzly Ridge routes. There appears to be an increasing trend in warbling vireo occurrences on the Grizzly Ridge route and a slightly decreasing trend on the Moon Lake route, according to analyses from the North American Breeding Bird Survey (Sauer et al. 2003). Four other BBS routes (Soapstone, Wasatch, Matt Warner Reservoir, and Flaming Gorge routes) are in similar habitats that occur on the Ashley National Forest or are in close proximity to the Forest (Sauer et al. 2003). These routes indicate a stable to increasing trend of warbling vireo occurrences (Sauer et al. 2003). Nature Conservancy data show warbling vireo populations in Utah to be “apparently secure” (NatureServe 2004). The Forest ran 13 transects (in a variety of habitats, with the majority of transects and warbling vireo occurrences being in aspen and riparian types) in 1994 and detected 222 warbling vireos; 17 transects (in same habitat types as 1994) in 1995 detected 117; one transect in 1996 (in ponderosa pine) detected one warbling vireo; one transect in 1998 and two transects in 1999 (all in sage brush) with 2 and 6 warbling vireos detected respectively (Ashley NF unpub. data). Other recorded sightings of warbling vireos on the Forest appear to be well distributed across the Forest (Ashley NF unpub. data.).

Nature Conservancy data show red-naped sapsucker populations in Utah to be “vulnerable” (NatureServe 2004). There were five red-naped sapsuckers counted on the BBS Moon Lake route in 2002 and two in 2003 (Sauer et al. 2003). The Grizzly Ridge route had one red-naped sapsucker occurrence in 2000 and three in 2001 (Sauer et al. 2003). The Flaming Gorge route did not have any red-naped sapsucker occurrences, but the Soapstone, Wasatch, and Matt Warner Reservoir routes appear to have stable to slightly increasing occurrences of red-naped sapsuckers (Sauer et al. 2003). The Forest ran 13 transects (in a variety of habitats, with the majority of transects and red-naped sapsucker occurrences being in aspen and riparian types) in 1994 and detected 17 red-naped sapsuckers; 17 transects (in same habitat types as 1994) in 1995 detected 5; one transect in 1996 (in ponderosa pine), one transect (sage brush) in 1998, and two transects (sage brush) in 1999 did not detect any red-naped sapsuckers (Ashley NF unpub. data.). Other recorded sightings of red-naped sapsuckers on the Forest appear to be well distributed across the Forest (Ashley NF unpub. data.).

Based on the available data for the Ashley National Forest and for Utah (Nature Conservancy data, BBS state wide data, BBS data on the Forest and surrounding the Forest, Ashley National Forest bird transects, and sighting records), it is believed that the warbling vireo population on the Forest is viable and stable. Based on this same data it is believed that the red-naped sapsucker population on the Forest is stable to slightly decreasing, but viable. The Ashley National Forest provides warbling vireo and red-naped sapsucker habitat that is well distributed across the Forest and is sufficient to sustain viable populations of these species (Forest Plan 1986).

Suitable habitat as described above is not present within the analysis area; therefore these species will not be evaluated further in this document.

White-tailed ptarmigan

White-tailed ptarmigans are indicator species for alpine meadows. They nest on the ground under shrubs or next to rocks on snow free areas in early June (DeGraaf et al. 1991) and incubate eggs for 23 days (NatureServe 2004). They feed on willow, forbs, leaves, flowers and some insects (DeGraaf et al. 1991).

Since the release of 57 white-tailed ptarmigan on the Ashley National Forest into the Painter Basin area in 1976, this species has populated and dispersed across much of the alpine habitat in the Uinta Mountains (UDWR 1999, UDWR 1997). The Utah Division of Wildlife believes white-tailed ptarmigan have increased in this basin to the point of reaching carrying capacity (UDWR 1997). The Division of Wildlife also believes, though population surveys have been difficult to complete, this population may be stable or slightly increasing (Maxfield, UDWR, personal communication 2003). The white-tailed ptarmigan in the Uinta Mountains became a hunted population as early as 1982, and has since remained a viable hunted population (UDWR 1999). Therefore, the population on the Forest is viable, is believed to be stable, and is well-distributed throughout its limited range on the Forest.

Suitable habitat as described above is not present in the within the analysis area, therefore the white-tailed ptarmigan will not be evaluated further in this document.

MIGRATORY BIRD SPECIES

A draft Memorandum of Understanding dated December 9, 2002 between the USDA Forest Service, USDI Bureau of Land Management, and USDI Fish and Wildlife Service (2002) has been written to promote the conservation of migratory birds, and provides direction for managing migratory birds. This direction includes identifying species listed in the Fish and Wildlife Service Birds of Conservation Concern that are likely to be present in the area of the proposed action, and to utilize best available demographic, population, or habitat association data in the assessment of impacts to these species.

The Utah Partners in Flight (PIF) working group also completed a statewide avian conservation strategy (Parrish et al. 2002). This strategy identifies “priority species” for conservation due to declining abundance, distribution, or vulnerability to various local and/or range-wide risk factors. This list is to be used as a tool by federal and state agencies in prioritizing bird species that should be considered for conservation action (Parrish et al. 2002). One application of this strategy is to give these birds specific consideration when analyzing effects of proposed management actions, and to implement the recommended conservation measures where appropriate.

The following species on the U.S. Fish and Wildlife Service list of Birds of Conservation Concern and the Utah Partners in Flight “priority species” list, that have not been discussed in previous sections, and are associated with those habitat types in or near the project area include, the American avocet, black-necked stilt, black-throated gray warbler, Brewer’s sparrow, burrowing owl, loggerhead shrike, northern harrier, pinyon jay, pygmy nuthatch, prairie falcon, sage sparrow, Virginia’s warbler, and Wilson’s phalarope, American white pelican, bobolink, ferruginous hawk, gray vireo, long-billed curlew, McCown’s longspur, short-eared owl, snowy plover, and Swainson’s hawk.

American avocet

Avocets are typically found in lowland marshes, ponds, or alkaline lakes, and feed during the day mostly on aquatic insects/larvae and seeds of aquatic plants (Parrish et al. 2002). Marginal habitat exists on the allotment near the Linwood Pond, but better habitat exists outside the allotment boundary in the Henry’s Fork Wetlands. Avocets have been documented in the Henry’s Fork Wetlands during spring and fall migrations. Nature Conservancy data show American avocets populations to be “imperiled” in Utah and “vulnerable” in Wyoming (NatureServe 2004).

Black-necked stilt

Grassy marshes, mud flats, shallow ponds, and flooded fields are habitats where the black-necked stilt may be found (Parrish et al. 2002). These birds feed during the day on a variety of insects, which include beetles, mosquito larvae, and grasshoppers (Parrish et al. 2002). Nature Conservancy data show black-necked stilt populations to be “imperiled” in Utah and “vulnerable” in Wyoming (NatureServe 2004). Black-necked stilts have been documented in the outside of the allotment boundary in the Henry’s Fork Wetlands during spring and fall migrations, and nesting habitat exists along the shore of Flaming Gorge Reservoir within the Linwood Unit.

Black-throated gray warbler

Black-throated gray warblers are a small diurnal songbird typically found in semi-arid pinyon-juniper habitats, feed on insects, and nest about 1 to 10 meters from the ground in trees or shrubs (NatureServe 2004). Nature Conservancy data show black-throated gray warbler populations to be “apparently secure” in Utah and “vulnerable” in Wyoming (NatureServe 2004). No sightings of black-throated gray warblers have been recorded within or near the project area, however breeding and nesting habitat for this species exists in the South Valley Unit of the allotment. These birds may also be present within the allotment during spring and fall migrations.

Brewer’s sparrow

Brewer’s sparrows are a small sagebrush obligate songbird, which typically nest in sagebrush about 20 centimeters to 50 centimeters off the ground and feed on insects and seeds (Parrish et al. 2002). Nature Conservancy data show Brewer’s sparrow populations to be “apparently secure” in Utah and “vulnerable” in Wyoming (NatureServe 2004). Brewer’s sparrows have been recorded within or near the project area, and breeding and nesting habitat exists throughout the entire allotment, especially in the South Valley Unit.

Burrowing owl

The burrowing owl is a small owl that prefers open habitats such as grasslands, savannas, or prairies (NatureServe 2004). These owls use abandoned burrows for nesting, and feed on large insects, rodents, and occasionally birds (NatureServe 2004). Nature Conservancy data show Burrowing owl populations to be “vulnerable” in both Utah and Wyoming (NatureServe 2004). Burrowing owls not have been recorded within or near the allotment area, however due to the small populations of white-tailed prairie dogs and other burrowing animals on both the Linwood and South Valley Units, nesting habitat is available on the allotment.

Loggerhead shrike

Loggerhead shrikes prefer open pasture-like areas with scattered trees and shrubs (NatureServe 2004). These birds nest in shrubs or small trees and feed on large insects, small birds, lizards, frogs, and rodents (NatureServe 2004). Nature Conservancy data show loggerhead shrike populations to be “apparently secure” in both Utah and Wyoming (NatureServe 2004). Loggerhead shrikes have not been recorded within or near the allotment area, however the Linwood Unit contains good foraging and nesting habitat for this species.

Northern harrier

Northern harrier habitat consists of marshes, grasslands, and cultivated fields (NatureServe 2004). This species nests on the ground near small shrubs or tall weeds and feeds on large insects, reptiles, amphibians, birds and small and mediums sized mammals such as voles and rabbits (NatureServe 2004). Nature Conservancy data show Northern harrier populations to be “apparently secure” in both Utah and Wyoming (NatureServe 2004). Northern Harriers have been documented within and near the Linwood-South Valley Allotment. The Linwood Unit and Henry’s Fork Wetlands currently provide good hunting and nesting habitat for this species.

Pinyon jay

Pinyon jays are closely tied to pinyon-juniper woodlands, where they nest in trees (1 to 9 meters off the ground) and feed on pinyon pine seeds, berries, and insects (NatureServe 2004). Nature Conservancy data show pinyon jay populations to be “apparently secure” in Utah and “secure” in

Wyoming (NatureServe 2004). Pinyon jays have been documented within the Linwood-South Valley Allotment, and the South Valley Unit currently provides good foraging and nesting habitat for this species.

Pygmy nuthatch

Pygmy nuthatches feed on insects and pine seeds, and are commonly found in ponderosa pine communities where they often roost at night in cavities or nest in small holes of standing dead snags (NatureServe 2004). Pygmy nuthatches are found less frequently in pinyon-juniper woodlands (NatureServe 2004). Nature Conservancy data show pygmy nuthatch populations to be “vulnerable” in Utah and “imperiled” in Wyoming (NatureServe 2004). Pygmy nuthatches have not been documented within the Linwood-South Valley Allotment and, due to the lack of ponderosa pines (and standing dead snags), the Linwood-South Valley Allotment and surrounding area is marginal habitat for this species.

Prairie falcon

Prairie falcons primarily roost and nest on south facing ledges in cliff habitat under overhangs that provide protection from the sun and rain (NatureServe 2004). Prairie falcons feed on small mammals (especially ground squirrels), lizards, and birds (NatureServe 2004). Nature Conservancy data show Prairie falcon populations to be “apparently secure” in both Utah and Wyoming (NatureServe 2004). Prairie falcons have not been documented within the Linwood-South Valley Allotment, but the steep cliff habitat on the east end of the South Valley Unit in Sheep Creek Bay, and sufficient prey base, indicates presence of good habitat for this species in this Unit.

Sage sparrow

The sage sparrow is a shrub-steppe obligate, nesting in shrubs or on the ground and feeding on insects and seeds (Parrish et al. 2002). Nature Conservancy data show sage sparrow populations to be “vulnerable” in both Utah and Wyoming (NatureServe 2004). Sage sparrows have been documented within the Linwood-South Valley Allotment, and good habitat exists in both the Linwood and South Valley Units.

Virginia’s warbler

Virginia’s warblers are typically found in dry, brushy, scrubby, woodland slope areas during the breeding season and nest on the ground under dense brush (Parrish et al. 2002). These birds forage on the ground in thick brush for insects (Parrish et al. 2002). Nature Conservancy data show Virginia’s warbler populations to be “apparently secure” in Utah and “imperiled” in Wyoming (NatureServe 2004). Virginia’s warblers have not been documented within the Linwood-South Valley Allotment, but nesting and foraging habitat exists in both the Linwood and South Valley Units. The South Valley Unit has the best habitat with brushy, steep, woodland slopes.

Wilson’s phalarope

Wilson’s phalaropes feed on aquatic insects or plants along muddy shores of lakes or ponds, and prefer shallow freshwater or saline ponds, marshes and wet meadows (NatureServe 2004). They nest along the edge of shallow water bodies in wet meadows and grassy marshes (NatureServe 2004). Nature Conservancy data show Wilson’s phalarope populations to be “imperiled” in Utah

and “vulnerable” in Wyoming (NatureServe 2004). Wilson’s phalaropes have not been documented within the Linwood-South Valley Allotment or surrounding area, but nesting and foraging habitat exists in the Linwood Unit and nearby Henry’s Fork Wetlands.

American white pelican

The American white pelican feeds mainly on fish and resides in habitats such as reservoirs, bays, and marshes (Parrish et al. 2002). They nest on the ground on islands or peninsulas where it is protected from terrestrial predators (Parrish et al. 2002). The only known breeding colonies of white pelicans in Utah are located within the “Utah/Great Salt Lake ecological complex” (Parrish et al. 2002). Nature Conservancy data show American white pelican populations to be “critically imperiled” in both Utah and Wyoming (NatureServe 2004). American white pelicans have not been documented within the Linwood-South Valley Allotment boundary, Henry’s Fork Wetlands, Linwood Bay, or Flaming Gorge Reservoir. However, American white pelicans may use the Flaming Gorge Reservoir, adjacent to the allotment, as a staging area during spring and fall migrations.

Bobolink

Bobolink habitat in the West consists of wet meadows, grasslands, irrigated pastures, and hay fields (Parrish et al. 2002). Bobolinks build nests on the ground located in wet habitats (Parrish et al. 2002). They feed on invertebrates, forbs, and weed and grain seeds (Parrish et al. 2002). Nature Conservancy data show bobolink populations to be “imperiled” in Utah and “vulnerable” in Wyoming (NatureServe 2004). Bobolinks have not been documented within the Linwood-South Valley Allotment boundary or surrounding areas, but good habitat for bobolinks is found within the Linwood Unit.

Ferruginous hawk

Ferruginous hawks prefer open country characterized by sagebrush and/or salt-bush-greasewood on the periphery of pinyon-juniper woodlands (Parrish et al. 2002). They nest in trees or shrubs, cliffs, and on the ground on rock outcrops (Parrish et al. 2002). They feed on small mammals (prairie dogs and ground squirrels), birds, amphibians, reptiles, and large insects (Parrish et al. 2002). Nature Conservancy data show Ferruginous hawk populations to be “imperiled” in Utah and “vulnerable” in Wyoming (NatureServe 2004). Ferruginous hawks have not been documented within the Linwood-South Valley Allotment boundary or surrounding areas, but good hunting and nesting habitat exists within both the Linwood and South Valley Units.

Gray vireo

Gray vireo breeding habitat is found in hot, semi-arid, shrubby, pinyon-juniper habitats, and nests are typically found in junipers or sagebrush 0.6 to 2.5 meters from the ground (Parrish et al. 2002). They feed on insects, typically foraging in the lower canopies of pinyon-juniper woodlands (Parrish et al. 2002). Nature Conservancy data show gray vireo populations to be “imperiled” in Utah and not to exist in Wyoming (NatureServe 2004). Gray vireos have not been documented within the Linwood-South Valley Allotment boundary and surrounding areas, but good foraging and nesting habitat exists within the pinyon-juniper woodlands of the South Valley Unit.

Long-billed curlew

Long-billed curlew habitat consists of short grassy meadows usually near water (Parrish et al. 2002). They nest on the ground in clumps of grass and feed on various insects, berries, worms, toads, and larvae of insects (Parrish et al. 2002). Nature Conservancy data show long-billed curlew populations to be “imperiled” in Utah and “vulnerable” in Wyoming (NatureServe 2004). Long-billed curlews have not been documented within the Linwood-South Valley Allotment boundary, but good foraging and nesting habitat exists within the Linwood Unit and in the nearby Henry’s Fork Wetlands.

McCown’s longspur

McCown’s longspur habitat is characterized as short grass plains or plowed stubble fields, and nests are usually found on the ground near the base of a shrub or beside cattle dung (NatureServe 2004). These birds feed on insects they glean from the ground. Nature Conservancy data show that McCown’s longspur populations do not occur in Utah and are “vulnerable” in Wyoming (NatureServe 2004). McCown’s longspurs have not been documented within the Linwood-South Valley Allotment boundary or surrounding area and likely would only be found within the analysis area as an incidental migrant.

Short-eared owl

Short-eared owls prefer large open areas near water such as marshes, bogs, meadows, and old fields with short vegetation for nesting and foraging (NatureServe 2004). These owls nest on the ground in a slight depression, and mainly eat rodents and other small mammals (NatureServe 2004). Nature Conservancy data show that short-eared owl populations are “imperiled” in both Utah and Wyoming (NatureServe 2004). Short-eared owls have not been documented within the Linwood-South Valley Allotment boundary or surrounding area, but hunting and nesting habitat are found on the allotment in the Linwood Unit, and outside of the allotment in the Henry’s Fork Wetlands.

Snowy plover

Dry mud or salt flats, beaches, sandy shores of lakes, and ponds characterize snowy plover habitat (NatureServe 2004). These birds feed on insects and small crustaceans, and nest on the ground on open dry mud flats or sandy beaches (NatureServe 2004). Nature Conservancy data show that snowy plover populations are “imperiled” in Utah and “critically imperiled” in Wyoming (NatureServe 2004). Snowy plovers have not been documented within the Linwood-South Valley Allotment boundary or surrounding area, but foraging and nesting habitat are found along the shore of Flaming Gorge Reservoir as the shoreline fluctuates.

Swainson’s hawk

Swainson’s hawks are typically associated with open woodland areas as well as cultivated lands (NatureServe 2004). Nests are typically located in a solitary tree or rock ledges (Green and Morrison 1983). Swainson’s hawks feed on small mammals during the breeding season and invertebrates during other times of the year (NatureServe 2004). Nature Conservancy data show that Swainson’s hawk populations are “vulnerable” in Utah and “apparently secure” in Wyoming (NatureServe 2004). Swainson’s hawks have not been documented within the Linwood-South Valley Allotment boundary or surrounding area, but foraging and nesting habitat are found throughout the allotment.

3. ENVIRONMENTAL CONSEQUENCES (Wildlife)

a. Alternative 1 - Maintain Current Grazing (No Action Alternative)

1. Direct and Indirect Effects – Irrigated meadows in the Linwood portion of the allotment appear to have declined in grass production over the last several years. Inadequate water distribution has created areas in the unit that remain saturated during much of the growing season and now support patches of cattails and juncus species. Conversely, lack of water has created other areas that are reverting to annual weeds and native salt grass pasture. Current conditions existing in the Linwood Unit appear to be a combined result of high intensity grazing along with reduced water distribution capacity.

High intensity spring and fall grazing in the Linwood Unit leaves little residual cover outside of the Linwood Pond enclosure. This grazing rotation creates a range of wildlife effects depending on the species. Spring and fall grazing results in a steady source of fresh new growth and maintains an abundance of short grass cover during most of the year. These growing conditions favor wildlife species dependent on short grass or low growing vegetation for nesting or foraging. Geese in particular use re-growth areas in proximity to water for foraging during the spring and fall migration. Species like mountain plovers and killdeer also use areas with short vegetation for nesting and brood rearing. The May grazing season currently limits nesting opportunities for many early nesters that nest during late April or early May. Grazing during May also increases the risks of nest trampling by livestock for species like geese and plovers and effectively negates the benefit accrued from summer/fall grazing. Consequently, the ongoing spring and fall grazing rotation on the Linwood Unit results in little or no successful nesting by ground nesting or some waterfowl species. Gilbert et al. (1996) reported similar results in grazing studies in Colorado. They determined that nest density for waterfowl declined with increasing grazing intensity and that declines were apparent even after the first season of only light grazing.

The South Valley Unit is grazed once a year in late fall. This late fall/early winter grazing pattern has been in effect for approximately 25 years and has maintained healthy communities of shrub and grassland types in this Unit. Grazing effects on this unit are evident as subtle changes in understory vegetation or around concentration areas where damage of shrubs by livestock trampling is evident. Because grazing occurs in late fall, plant maturation and seed set are complete prior to the onset of grazing. This helps to reduce the effects from livestock grazing on ground nesting or ground cover dependent species. Fall grazing also better distributes cattle use across the unit and so reduces the size and number of concentration areas. Consequently, damage by livestock to understory vegetation is limited to constriction points within the unit. These concentration areas are typically small in scale (less than 5 acres). The rugged nature and the size of this unit also result in areas of the unit receiving little or no use by livestock.

Existing fences on the allotment could directly affect species such as mule deer, bighorn sheep, and antelope if they are not maintained to appropriate wildlife specifications.

FEDERALLY THREATENED, ENDANGERED, AND PROPOSED SPECIES

Bald eagle

No measurable direct effects to bald eagles or habitat suitability are expected as a result of continuing the existing grazing system. The bald eagle that has recently established a nest near the allotment has done so under the existing vegetative, hydrological, and recreational conditions. Bald eagles may be affected indirectly due to the removal of residual cover, which could affect foraging and hiding cover for prey species such as the desert cottontail or other small mammals. The establishment of the Henry's Fork Wetland has likely increased the number of waterfowl in the area, which would be an addition to the Bald eagle's prey base. Grazing would have no effect on the fish populations in the Flaming Gorge Reservoir, so this prey base would not be affected. Bald eagles could potentially use the entire allotment as a foraging area. Since the South Valley Unit currently provides quality habitat for potential prey, there would be no noticeable changes expected on prey species habitat in the South Valley Unit.

FOREST SENSITIVE SPECIES

No measurable effects to the common loon, mountain plover, sage-grouse, spotted bat, Townsend's big-eared bat, and pygmy rabbit, or habitats are expected as a result of continuing with the existing grazing system. High intensity grazing on the Linwood Unit will continue to negatively impact habitat suitability for the peregrine falcon and trumpeter swan. However, because these species have not been recorded on the Linwood Unit, no direct effects to these species are expected. Indirectly, high cattle numbers combined with yearly spring/fall grazing will continue to cause a decline in vegetation production in the Linwood Unit, thus indirectly impacting habitat suitability for wetland associated species. Habitat values for greater sage-grouse will continue to be maintained by the current grazing practices on the South Valley Unit. Winter grazing on this unit currently results in few if any effects to this species.

Trumpeter swan and common loon use of the allotment is not expected to change despite anticipated improvements to wet meadow habitats on the Linwood Unit. To date, no trumpeter swans have been observed using the Linwood Pond enclosure despite being excluded from grazing, nor have common loons been documented in Linwood Bay. Pond size and its relation to other water bodies may have a greater influence on swan use of habitats on the allotment than does habitat availability. Therefore, the only anticipated changes to swan and loon habitat include reduced disturbance from livestock during the spring and fall migration period, and increases in residual cover and improved foraging for the swans along the reservoir shoreline.

Early spring grazing (April to May) represents the only threat to the mountain plover due to physical disturbance caused by cattle during the nesting period. The actual removal or short cropping of vegetation indirectly provides a benefit for this species given its preference for short or sparse vegetation for nesting (Day 1996; Leachman and Osmundson 1990).

Basin big sagebrush stands or potential pygmy rabbit habitat in the South Valley Unit is not expected to have a measurable change due to removal of livestock grazing. The gradual increases in the amount of residual grass cover in sagebrush steppe types are expected, since they are currently influenced by other factors besides livestock. Based on ocular surveys of habitat conditions for this vegetation type on the allotment, current winter grazing does not negatively impact either sagebrush types or the understory component important to this species.

Spotted or Townsend's big-eared bat habitats would not be affected by removal of grazing since their prey species are mostly moths. The only standing water source on the allotment is the Linwood Pond, which is excluded from grazing.

MANAGEMENT INDICATOR SPECIES (MIS)

Effects to MIS will vary by species as a result of the existing grazing system. The Lincoln's and song sparrows are the only MIS species negatively impacted by the current grazing system. Since these species are dependent on woody riparian communities, spring/fall grazing in the Linwood Unit will continue to result in breakage and browsing of small willow patches by livestock in this unit. The high intensity short duration grazing system practiced on this unit will continue to favor graminoid production over riparian shrub expansion. Water distribution capacity on the Linwood Unit will continue to decline, further limiting woody riparian habitats. Habitat values for other MIS like mule deer, elk, and the golden eagle will continue to be maintained by the current grazing practices on the South Valley Unit. Winter grazing on this unit currently results in few if any effects to these species.

Livestock grazing as proposed in this alternative will continue to negatively impact wildlife and wildlife habitats on the Linwood Unit. No negative effects to wildlife and wildlife habitats on the South Valley Unit are expected since current grazing has successfully maintained wildlife habitats.

MIGRATORY BIRD SPECIES

Effects to migratory birds will vary by species as a result of the existing grazing system. Shorebirds, such as the American avocet, black-necked stilt, Wilson's phalarope, American white pelican, and long-billed curlew are ground nesters that would likely be impacted during the early spring nesting season by possible livestock trampling in the Linwood Unit. Moderate livestock grazing may benefit (NatureServe 2004), or have no effect on species such as the burrowing owl loggerhead shrike, northern harrier, bobolink, McCown's longspur, short-eared owl, and Swainson's hawk, since these species prefer short pasture-like areas to nest and forage.

Shrub steppe obligate species, and birds with habitats in pinyon-juniper woodlands, such as the Brewer's sparrow, sage sparrow, Virginia's warbler, black-throated gray warbler, pinyon jay, gray vireo, pygmy nuthatch would not be directly affected by livestock grazing since these species would generally be nesting off the ground and/or using habitats in the South Valley Unit when cattle are not present.

The removal of residual cover by cattle grazing in the Linwood Unit may indirectly affect small mammal species, which are the forage base for raptor species such as the prairie falcon and ferruginous hawk. The removal of residual cover such as grasses, weeds, and shrubs would reduce hiding cover for these small mammals. This may indirectly affect prairie falcons and ferruginous hawks positively by reducing the hiding cover for small mammals making it easier to hunt and capture these species. It may ultimately affect these small mammals negatively by reducing the populations due to a lack of forage and hiding cover.

2. Cumulative Effects – Cumulative effects for wildlife species were evaluated at the Henry’s Fork-Flaming Gorge 6th code watershed level. Correcting for about 691 acres of the allotment within an adjoining watershed (and are not grazed), the Linwood South Valley Allotment represents about 9.0% of the cumulative effects area. Of this area, the Linwood Unit represents approximately 0.5%, and the South Valley Unit represents about 8.5% of the total area evaluated. Considering the activities previously discussed in the *Past, Present, and Reasonably Foreseeable Activities* section, and given the favorable habitat conditions common on the South Valley Unit, cumulative effects to wildlife habitats as a result of grazing on the allotment are negligible and have a minor influence on wildlife use in the surrounding area.

Cattle grazing on private and state lands adjacent to the allotment will reduce residual cover, which will affect some wildlife species in these areas. Conifer encroachment projects will reduce pinyon and juniper (up 6 inches in diameter) on 140 acres of the allotment. The small amount of conifer removal will not detrimentally affect wildlife species, due to the abundance of pinyon and juniper within the allotment and present in the surrounding cumulative effects area. Big game hunting would affect mule deer and elk populations on the allotment and within the cumulative effects area, such as slightly reducing numbers and adding disturbance during the hunting season. There are few system roads on Forest Service lands within the allotment, and these roads are not frequently maintained, so disturbance to wildlife would be low to non-existent. Recreation activities such as dispersed camping, fishing, and water based activities along the shore of Flaming Gorge Reservoir within the allotment and cumulative effects area could potentially affect wildlife species especially during nesting seasons in both Units. Unmanaged all terrain vehicle (ATV) use in the South Valley Unit could potentially disturb wildlife during nesting and birthing seasons. The possibility of using prescribed fire in the Henry’s Fork Wetlands to manage vegetation would reduce hiding and foraging cover for species associated with these wetlands, however effects from future projects involving prescribed fire would be analyzed in a separate National Environmental Policy Act (NEPA) document.

b. Alternative 2 – No Grazing

1. Direct and Indirect Effects – Under Alternative 2, livestock grazing would not be allowed on Forest Service administered lands within the Linwood-South Valley Allotment. All boundary fencing would be retained but approximately 2.6 miles of interior fences would be removed. Retaining allotment boundary fences could directly affect species such as mule deer, bighorn sheep, and antelope if they are not maintained to appropriate wildlife specifications.

This alternative would result in noticeable changes to vegetation structure and density within the Linwood Unit. This unit is irrigated or sub-irrigated by overflow from adjoining private fields and by canal extensions originating on private land. The amount of water available during the growing season will determine the degree and rate at which vegetation changes can occur.

Removing livestock grazing from the Linwood Unit would allow residual ground cover to increase throughout this unit. The greatest changes are expected on irrigated portions of the unit that are above the high water mark of the Flaming Gorge Reservoir. As vegetation density and residual cover increase, nesting habitat for ground nesting birds and waterfowl is also expected to improve (Lapointe et al. 2000). Habitat attractiveness for small mammals like voles and mice

would also improve as foraging and hiding cover increase. The amount of area maintained in low growing vegetation would become more restricted as the level of residual vegetation increases. This would reduce the acreage providing suitable nesting habitats for species like killdeer and plovers. Nesting habitat for these species would be restricted to areas along the reservoir shoreline, or salt grass/saltbush, and sagebrush/needle grass communities that are naturally sparsely vegetated. Any changes in nesting habitat distribution for these species would likely be offset by eliminating livestock disturbance during nesting. White-tailed prairie dog colonies on the allotment would also continue to maintain areas of low growing vegetation.

Beach areas along the Flaming Gorge Reservoir will continue to fluctuate both in size and degree of vegetation establishment according to existing water levels. However, a slow increase in the amount of residual vegetation along beach areas is expected in the absence of grazing. Annual grass and forb species would continue to dominate these areas, but the size and amount of bare ground or low growing vegetation will continue to be determined by fluctuations in reservoir water levels.

Changes to wildlife habitats in the South Valley Unit would not be as dramatic as those described for the Linwood Unit. This unit is currently in good ecological condition and provides for the habitat needs of species associated with sagebrush and grassland vegetation types. Because dormant season grazing removes herbaceous material only after plants have reached maturity, this type of grazing results in few negative effects to grassland plant communities. Consequently, removing livestock grazing from this unit is only expected to result in a gradual change in the accumulation of residual vegetation. The xeric nature of vegetation types in this unit and the quick decomposition of residual grass material (two to three years) is not expected to result in a large increase in the amount of residual vegetation. The most noticeable changes would be around livestock concentration areas where trampling damage to plants is highest.

In general, prolonged rest produces changes in grassland or wetland type community composition and structure. In mesic, or wetter habitats, increasing dead vegetation shades and reduces the vigor of new growth and minimizes the establishment of new seedlings. Gradually plant communities shift to climax types that can perpetuate themselves under conditions where mature plants represent a large percentage of the plant population. Spacing between individual plants is expected to develop and widen, providing opportunities for communities of algae, moss, lichen, and dead vegetation to occupy a larger percentage of the total ground cover. In more xeric plant communities like those in the South Valley Unit, a large proportion of these voids are expected to remain bare.

Changes in management that promote and maintain growth of taller vegetation may negatively affect species like the mountain plover and McCown's longspur, which prefer short vegetation. Conversely, increasing vegetation density and residual cover would benefit waterfowl, sage-grouse and neotropical species that nest in woodland, sagebrush, wetland, and grassland types. Indirectly, increases in prey species habitat structural complexity would benefit raptor species like the bald eagle, golden eagle, and peregrine falcon.

Manipulations in the length of rest periods can be used to create differences in the amount of residual standing vegetation needed to provide nesting, roosting, bedding, feeding, fawning, and

escape cover for different wildlife species. The amount of rest necessary to optimize these characteristics would result in some upland habitats displaying a reduction in maximum annual plant growth. In most cases this is an acceptable trade-off to maintain the residual cover desirable for wildlife purposes.

FEDERALLY THREATENED, ENDANGERED, AND PROPOSED SPECIES

Bald eagle

No measurable direct effects to bald eagles or habitat suitability are expected as a result of removing livestock from the allotment. Bald eagles may be positively affected indirectly due to the increase in residual cover, which could enhance the foraging and hiding cover for prey species such as the desert cottontail or other small mammals. The establishment of the Henry's Fork Wetland has likely increased the number of waterfowl in the area, which would be an addition to the Bald eagle's prey base. Since the South Valley Unit currently provides quality habitat for many potential prey, the only noticeable changes expected are improved prey species habitat on the Linwood Unit.

FOREST SENSITIVE SPECIES

Forest Sensitive Species expected on the allotment would benefit in different ways due to the exclusion of livestock grazing. Indirect benefits are expected for species like the peregrine falcon that prey on bird species benefiting from improvements to habitats on the Linwood Unit. Removing livestock grazing from the Linwood Unit is expected to increase residual cover and habitat complexity for waterfowl and other ground nesting prey species.

Trumpeter swan and common loon use of the allotment is not expected to change despite anticipated improvements to wet meadow habitats on the Linwood Unit. To date, no trumpeter swans have been observed using the Linwood Pond enclosure despite being excluded from grazing, nor have common loons been documented in Linwood Bay. Pond size and its relation to other water bodies may have a greater influence on swan use of habitats on the allotment than does habitat availability. Therefore, the only anticipated changes to swan and loon habitat include reduced disturbance from livestock during the spring and fall migration period, and increases in residual cover and improved foraging for the swans along the reservoir shoreline.

The amount and distribution of suitable habitat for the mountain plover is expected to decrease or change slightly as residual cover increases. Nesting habitat is expected to become more restricted as vegetation density and heights increase. This would limit suitable nest sites to vegetation in xeric habitat types that are naturally more open. Any negative changes in habitat distribution would be offset by the elimination of spring grazing and associated livestock disturbances for this and other early nesting species.

Sagebrush or sage-grouse habitats in the South Valley Unit are only expected to have minor changes due to removal of livestock grazing. These changes include possibly a slight increase in the amount of residual grass cover in sagebrush steppe types. Basin big sagebrush stands or potential pygmy rabbit habitat in the South Valley Unit is not expected to have a measurable change due to removal of livestock grazing. Any slight increase in residual cover would benefit this species by providing additional cover.

Spotted or Townsend's big-eared bat habitats would not be affected by removal of grazing since their prey species are mostly moths. The only standing water source on the allotment is the Linwood Pond, which is already excluded from grazing. The South Valley Unit would be grazed during fall/winter after these species of bats enter hibernation.

MANAGEMENT INDICATOR SPECIES

The limited Lincoln's and song sparrow habitat present on the Linwood Unit growing along irrigation ditches and seep areas is expected to improve due to lack of trampling damage by livestock. Only limited expansion of willow habitats is expected since habitat occurrence is limited more by moisture availability than any other single factor. Increased residual cover around existing willow clumps would also help to improve foraging opportunities for this species.

No direct effects to golden eagles are expected as a result of eliminating livestock grazing on the allotment. Indirectly this species would benefit from accumulations of residual cover across the allotment. Any increase in residual cover is expected to benefit prey species habitat, thus improving the forage base for this species. The greatest potential for change is expected on the Linwood Unit, where current grazing schedules limit prey species abundance. Only slight improvements in prey species habitat suitability are expected on the South Valley Unit given current habitat conditions.

No measurable changes to mule deer or elk habitat are expected due to removing livestock grazing from the allotment. Pinyon/juniper encroachment into adjoining vegetation types will continue to occur, slowly reducing shrub and grassland types in the future as tree canopies exceed 45% of the stand. Removing interior fences would benefit these species by helping to improve access across the allotment.

MIGRATORY BIRD SPECIES

Effects to migratory birds will vary by species as a result of the existing grazing system. Shorebirds, such as the American avocet, black-necked stilt, Wilson's phalarope, American white pelican, and Long-billed curlew are ground nesters that would be affected positively due to the removal of cattle from the allotment, because they would not be impacted during the early spring nesting season. Removing livestock from the allotment may have negative effects on species that prefer open pasture-like habitats for foraging and nesting (NatureServe 2004), such as the burrowing owl, loggerhead shrike, northern harrier, bobolink, McCown's longspur, short-eared owl, and Swainson's hawk.

Shrub steppe obligate species, and birds with habitats in pinyon-juniper woodlands, such as the Brewer's Sparrow, sage sparrow, Virginia's warbler, black-throated gray warbler, pinyon jay, gray vireo, and pygmy nuthatch would not be directly affected by the removal of cattle since these species would generally be nesting off the ground and/or using habitats in the South Valley Unit when cattle are not present. There would only be a slight increase in residual cover in the South Valley Unit.

Prairie falcons and ferruginous hawks would not be directly affected under this alternative since cattle grazing would be eliminated from the entire allotment. Therefore, no indirect effects would occur to small mammal populations.

Removing livestock grazing as proposed in this alternative would positively impact wildlife and wildlife habitats on the allotment. The most noticeable changes would occur in pasture habitat types in the Linwood Unit, with only slight improvements to upland habitat on the South Valley Unit. Of all the alternatives considered, this alternative best protects or maintains wildlife habitats on the allotment for the greatest number of wildlife species.

2. Cumulative Effects – The cumulative effects on wildlife from this alternative are similar to those described for the current condition. In addition, removing livestock grazing eliminates grazing considered only on FS portions (9%) of the cumulative effects area and therefore, would have little to no measurable impact when considered at the cumulative effects scale. The activities previously discussed in the *Past, Present, and Reasonably Foreseeable Activities* section, and more specifically in the Cumulative Effects Section for Alternative 1, would continue to contribute to the effects on wildlife, however they would not be cumulative since livestock grazing would be eliminated.

c. Alternative 3 – Maintain fall grazing on the South Valley Unit as currently managed, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – This alternative includes constructing a new pasture (South Linwood) within the Linwood Unit which would include the existing horse pasture to the north of Birch Creek and the remaining portion of the Linwood Unit to the east along the Flaming Gorge Reservoir. A short section of fence would be constructed to connect the existing horse pasture fence to the reservoir shoreline to the north. This would create a smaller North Linwood to the west of the Linwood access road that would encompass the existing Linwood Pond Exclosure. Stocking levels in South Linwood would be reduced to about 124 cow/calf pairs, and would be grazed once annually for about one month during the summer (i.e., June to July). North Linwood, including the Linwood Pond Exclosure, would be grazed once every five years to maintain residual cover for waterfowl nesting habitat (at a frequency not exceeding once every five years). On the year North Linwood and the Linwood Pond Exclosure were grazed, South Linwood would be rested from grazing. No changes in numbers and season of use would occur in the South Valley Unit.

Connected actions with this alternative include reconstructing ditches within South Linwood to improve grass production and increase the efficiency of watering existing fields. A new ditch, if needed, would be created along the west boundary fence in South Linwood running north to south to catch excess water coming from private lands. The dirt road heading south from the boat ramp along the existing fence line of the east side of the old horse pasture would be leveled to prevent water from draining away from the existing fields. Total fencing needed to isolate the Linwood access area and create North and South Linwood is estimated at 0.7 miles of new fence. This fence would be constructed according to the specifications appropriate for wildlife, especially big game species.

Dividing the Linwood Unit into two separate pastures would make available additional nesting habitat for waterfowl and shoreline species. This would also create additional management options in the future by providing opportunities to manage these pastures in conjunction with the Henry's Fork Wetlands. Separate pastures would allow for controlled use of livestock management or burning to help maintain plant vigor and habitat structure complexity to better meet the habitat requirements of a wider range of wildlife species. Increasing the percent of ungrazed area, along with reducing livestock numbers and changing season of use is expected to result in higher nest survival by increasing the amount of residual cover and thereby increasing the search area for predators. The sub-irrigated nature of the Linwood Unit area would also result in increased densities of small mammal like voles in response to increasing vegetative cover in both North and South Linwood.

Under this alternative, the 60 acres in North Linwood would be grazed one year out of five in conjunction with the Linwood Pond Exclosure. This would increase the total amount of ungrazed area available for small mammals and ground nesting species. Grazing every fifth year would help to maintain plant vigor and habitat complexity while minimizing effects to wildlife species. This type of rotation would improve or maintain habitat for wildlife species requiring complex residual cover for nesting and foraging on about 93 acres.

Grazing South Linwood in the summer would reduce or eliminate the impact to early nesting species. It would also create nesting habitat for early spring nesters or species selecting for actively growing vegetation. District observations at the Henry's Fork Wetland indicate that Canadian geese are some of the earliest nesters with most broods observed on the ponds by mid May.

Improving the irrigation ditch system within this pasture is expected to decrease the amount of area in weed and annual plant production while increasing the percent of area in perennial plant production. Over all, plant production on South Linwood is expected to slowly increase residual cover available for late nesting waterfowl species like teal. Grazing this pasture for only one month during the summer would allow re-growth to occur in this pasture during the rest of the summer season, providing a source of seeds and vegetation during the fall migration period, thus expanding feeding habitat adjoining the Henry's Fork Wetland.

Grazing South Linwood for only one month in the summer would remove residual plant cover after plants have stopped growing and after the nesting season. Allowing livestock to graze the area in the summer would create foraging habitat for geese during the spring migration by providing re-growth areas early in the spring.

Changes in use pattern and a reduction in livestock numbers would result in improvements to wildlife habitat in the Linwood Unit. The anticipated negative effects to wildlife by implementing Alternative 3 would be reduced when compared to Alternative 1. Grazing effects on the South Valley Unit would be similar to those described for Alternative 1 since no changes in cattle numbers or season of use are proposed.

FEDERALLY THREATENED, ENDANGERED, AND PROPOSED SPECIES

Bald Eagle

No measurable direct effects to bald eagles or habitat suitability are expected as a result of continuing the existing grazing system. The Bald eagle that has recently established a nest near the allotment has done so under the existing vegetative, hydrological, and recreational conditions, and under Alternative 3 these conditions would be improved on the Linwood Unit. Bald eagles may be affected indirectly due to the removal of residual cover, which could affect foraging and hiding cover for prey species such as the desert cottontail or other small mammals. The establishment of the Henry's Fork Wetland has likely increased the number of waterfowl in the area, which would be an addition to the Bald eagle's prey base. Grazing would have no effect on the fish populations in the Flaming Gorge Reservoir, so this prey base therefore would not be affected. Bald eagles could potentially use the entire allotment as a foraging area. Since the South Valley Unit currently provides quality habitat for potential prey, there would be no noticeable changes expected on prey species habitat in the South Valley Unit.

FOREST SENSITIVE SPECIES

Indirect benefits are expected for species like the peregrine falcon since it preys on bird species that would benefit from improvements to habitats on the Linwood Unit. Removing livestock grazing from portions of the Linwood Unit, along with reducing livestock numbers and altering season of use in the South Linwood pasture would increase cover and habitat complexity for waterfowl and other ground nesting prey species.

Trumpeter swan and common loon use of the allotment is not expected to change despite anticipated improvements to wet meadow habitats on the Linwood Unit. To date, no trumpeter swans have been observed using the Linwood Pond enclosure despite being excluded from grazing, nor have common loons been documented in Linwood Bay. Consequently, pond size and its relation to other water bodies may have a greater influence on swan use of habitats on the allotment than does habitat availability. Therefore, the only anticipated changes to swan and loon habitat include reduced disturbance from livestock during the spring and fall migration period, and increases in residual cover and improved foraging for the swans along the reservoir shoreline and around the Linwood Pond due to elimination of grazing in North Linwood.

No direct effects to sage-grouse or their habitats in the South Valley Unit are expected since no changes in livestock numbers or season of use are proposed. No direct effects to basin big sagebrush or suitable pygmy rabbit habitat in the South Valley Unit are expected since no change in livestock numbers or season of use are proposed. Based on ocular surveys of habitat conditions for this vegetation type on the allotment, current winter grazing does not negatively impact either sagebrush types or the understory component important to this species.

The amount and distribution of suitable habitat for the mountain plover is expected to change slightly as residual cover increases. Nesting habitat is expected to become more restricted in North Linwood as vegetation density and heights increase in response to changes in livestock management. Suitable nest sites would continue to be readily available, in vegetation types along the lake shoreline or in xeric types that are naturally more open in South Linwood. As with other early nesting species, spring grazing in South Linwood would have a greater potential to result in disturbances to nest establishment, while summer grazing of South Linwood effectively eliminates all risks of grazing disturbances.

Spotted or Townsend's big-eared bat habitats would not be affected by removal of grazing since their prey species are mostly moths. The only standing water source on the allotment is the Linwood Pond, which is already excluded from grazing. The South Valley Unit would be grazed during fall/winter after these species of bats enter hibernation.

MANAGEMENT INDICATOR SPECIES (MIS)

The limited Lincoln's and song sparrow habitat present on the Linwood Unit growing along irrigation ditches and seep areas is expected to improve due to a reduction in the level of trampling damage by livestock. Only limited expansion of willow habitats is expected since habitat occurrence is limited more by moisture availability than any other single factor. Increased residual cover around existing willow clumps would also help to improve foraging opportunities for these species. No direct effects to golden eagles are expected. Some improvement in prey species habitat is expected in the Linwood Unit in response to increases in the amount of residual cover. No change in prey species habitat suitability are expected on the South Valley Unit since no change in livestock numbers or grazing season are proposed.

No measurable changes to mule deer or elk habitat are expected since no change in livestock numbers or season of use are proposed for the South Valley Unit. Pinyon/juniper encroachment into adjoining vegetation types would continue at existing rates, slowly reducing shrub and grassland types in the future as tree canopy cover exceeds 45%.

MIGRATORY BIRD SPECIES

Effects to migratory birds will vary by species as a result of the existing grazing system. Of the shorebirds, such as the American avocet, black-necked stilt, Wilson's phalarope, American white pelican, and long-billed curlew, only the species that nest after June would likely be impacted by possible livestock trampling in the Linwood Unit since early spring grazing would be abolished. Moderate livestock grazing may benefit (NatureServe 2004) or have no effect on species such as the burrowing owl, loggerhead shrike, northern harrier, bobolink, McCown's longspur, short-eared owl, and Swainson's hawk, since these species prefer short pasture-like areas to nest and forage.

Shrub steppe obligate species, and birds with habitats in pinyon-juniper woodlands, such as the Brewer's sparrow, sage sparrow, Virginia's warbler, black-throated gray warbler, pinyon jay, gray vireo, pygmy nuthatch would not be directly affected by livestock grazing since these species would generally be nesting off the ground and/or using habitats in the South Valley Unit when cattle are not present.

The removal of residual cover by cattle grazing in the Linwood Unit may indirectly affect small mammal species, which are the forage base for raptor species such as the prairie falcon and ferruginous hawk. The removal of residual cover such as grasses, weeds, and shrubs would reduce hiding cover for these small mammals. This may indirectly affect prairie falcons and ferruginous hawks positively by reducing the hiding cover for small mammals making it easier to hunt and capture these species. It may ultimately affect these small mammals negatively by reducing the populations due to a lack of forage and hiding cover.

Of the action alternatives, this alternative maintains or improves wildlife habitats since it maintains current livestock numbers and season of use on the South Valley Unit while changing season of use and reducing livestock numbers on the Linwood Unit (North and South Linwood) to mitigate effects on the greatest number of wildlife species. Proposed changes to livestock management on the Linwood Unit helps to create habitat complexity by creating areas having short actively growing vegetation (South Linwood) intermingled with residual cover areas (Linwood Pond Exclosure and North Linwood) on a predictable and recurring basis. Additionally, grazing South Linwood during different periods helps to meet the habitat requirements for both early and late ground nesting bird species. Summer grazing in the Linwood Unit in particular would favor the largest number of wildlife species.

2. Cumulative Effects – The cumulative effects on wildlife from this alternative are similar to those described for the current condition in Alternative 1. In addition, reducing livestock numbers on the Linwood Unit only reduces the effects of grazing on a portion (0.5%) of the cumulative effects area and therefore, would have little to no measurable impact when considered at the cumulative effects scale. The activities previously discussed in the *Past, Present, and Reasonably Foreseeable Activities* section, and more specifically in the Cumulative Effects Section for Alternative 1, would have a minor influence on wildlife use in the surrounding area.

d. Alternative 4 – Change grazing in the South Valley Unit from fall/winter to spring/summer to maximize browse production, and change grazing numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – Under Alternative 4, livestock grazing effects on wildlife would remain the same on the Linwood Unit as those described under Alternative 3, however, proposed spring grazing on the South Valley Unit would change habitat conditions on upland habitats.

Changing livestock grazing in the South Valley Unit to spring grazing is expected to negatively impact wildlife species dependent on brush and grassland types. The presence of livestock during the spring would discourage use by some ground nesting birds and increase the risk of nest trampling/loss for others. Grazing to maximize browse production and shrub establishment would also require intensive and prolonged use over a period of several years in order to cause the desired effect. Prolonged grazing at this level would result in root reduction of perennial grasses, thereby increasing the incidences of plant mortality and soil exposure in the future. Further, the more frequently a plant is grazed during its growing period, the more likely it would be negatively affected by overgrazing. Bunch grass types common in the South Valley Unit are especially susceptible to this type of grazing. Grazing heavily in the spring also appears to favor the expansion of cheat grass and other annual species in this land type. The allotment currently lacks an adequate water distribution system and so grazing during this period would increase livestock concentration and mechanical disturbance around the reservoir shoreline and other watering areas.

Grazing and the physical disturbances caused by livestock are expected to impact both the quantity and quality of wildlife habitats. Grazing would remove graminoid cover during the

summer period, reducing habitat suitability for waterfowl, ground nesting birds, and small mammals. Heavy grazing during this period would remove or alter hiding cover and reduce habitat attractiveness for early nesting species dependent on residual grass cover for nesting.

It is unlikely that a build up of organic matter is a primary factor in limiting the establishment of shrub species in this Unit. Naturally occurring spacing between individual grass plants in climax vegetation types in this area creates the openings needed for shrub establishment. Age structure in shrub communities in this Unit are also naturally skewed in favor of older or mature plants better able to weather large fluctuations in moisture availability common in these environments. In short, existing stand density and other site-specific factors (soils, moisture, etc.) probably exert a greater pressure on the number of total shrub plants that can be supported in this area.

Heavy spring grazing would also increase soil scarification and reduces grass competition within pinyon/juniper types, further facilitating their establishment and encroachment into other habitats. Personal observations of pinyon/juniper encroachment in this Unit suggest that existing conditions are at least in part correlated to similar grazing practices historically (Martinez, USFS, personal observations 2004). Therefore, long-term application of this grazing rotation is expected to cause site conditions that further favor the expansion of these species. Long-term increases of pinyon/juniper canopy cover approaching or exceeding 45% are noteworthy, since they result in a corresponding decrease in understory grass and shrub production (Goodrich, USFS, personal communication 2004).

Spring grazing would also be detrimental to the development of habitat characteristics needed by ground nesting or residual cover dependent species. Not allowing grassland types to trend towards climax or to allow maturation of individual types during the growing season would negatively impact species like the long-billed curlew, upland sandpiper, longspur, and grasshopper sparrow.

FEDERALLY THREATENED, ENDANGERED, AND PROPOSED SPECIES

Bald Eagle

No measurable direct effects to bald eagles or habitat suitability are expected as a result of continuing the existing grazing system on the Linwood Unit. The bald eagle that has recently established a nest near the allotment has done so under the existing vegetative, hydrological, and recreational conditions, and under Alternative 3 these conditions would be improved on the Linwood Unit. Bald eagles may be affected indirectly due to the removal of residual cover, which could affect foraging and hiding cover for prey species such as the desert cottontail or other small mammals. The establishment of the Henry's Fork Wetland has likely increased the number of waterfowl in the area, which would be an addition to the bald eagle's prey base. Grazing would have no effect on the fish populations in the Flaming Gorge Reservoir, so this prey base would not be affected. Bald eagles could potentially use the entire allotment as a foraging area. Although the South Valley Unit currently provides quality habitat for potential prey, shifting to summer grazing on the South Valley Unit has the potential to remove habitat for potential prey species.

FOREST SENSITIVE SPECIES

Indirect benefits are expected for species like the peregrine falcon since it preys on bird species that would benefit from improvements to habitats on the Linwood Unit. Removing livestock grazing from portions of the Linwood Unit, along with reducing livestock numbers and altering season of use in North and South Linwood would increase cover and habitat complexity for waterfowl and other ground nesting prey species.

Trumpeter swan and common loon use of the allotment is not expected to change despite anticipated improvements to wet meadow habitats on the Linwood Unit. To date, no trumpeter swans have been observed using the Linwood Pond enclosure despite being excluded from grazing, nor have common loons been documented in Linwood Bay. Consequently, pond size and its relation to other water bodies may have a greater influence on swan use of habitats on the allotment than does habitat availability. Therefore, the only anticipated changes to swan and loon habitat include reduced disturbance from livestock during the spring and fall migration period, and increases in residual cover and improved foraging for the swans along the reservoir shoreline and around the Linwood Pond due to elimination of grazing in North Linwood.

The amount and distribution of suitable habitat for the mountain plover is expected to change proportionately to the amount and distribution of residual ground cover. Nesting habitat is expected to become more restricted in North and South Linwood of the Linwood Unit as vegetation density and heights increase in response to proposed changes in livestock management. Suitable nesting habitat for this species found in vegetation types along the lake shoreline or in xeric types in the South Valley Unit would also be negatively impacted by spring/summer livestock grazing. Though use by this species is not expected to occur on the allotment, spring/summer grazing as proposed would negatively impact this species should it occur.

Spring and summer grazing on the South Valley Unit could directly and indirectly impact sage-grouse or sagebrush habitats in the South Valley Unit. The presence of livestock on the South Valley Unit during this time of year would potentially allow for livestock to disturb nesting grouse that might be present on the allotment. Further, the level of grazing required to initiate shrub establishment would indirectly alter habitat characteristics important for this species. Grazing as proposed to meet stated shrub objects would allow cattle to remove forbs and other succulent plants important to grouse during the spring/summer periods, and would initiate a downward trend in forage and habitat quality for this species.

Although the pygmy rabbit is not known to occur on the District, spring/summer grazing as proposed for the South Valley Unit would negatively impact suitable habitat for this species. Because this species is closely correlated with Basin big sagebrush, cattle grazing would negatively impact habitat for this species. Basin big sagebrush types on the allotment tend to be located along drainage bottoms and other productive areas that would be selected by livestock. Grazing during this period would allow cattle to remove residual cover important for this species, while resulting in increased trampling of these areas. Observation of this vegetation type on the allotment indicate that these areas were likely some of the first vegetation communities to be altered by historical livestock grazing in the area.

MANAGEMENT INDICATOR SPECIES (MIS)

Effects to Lincoln's and song sparrows habitat present on the Linwood Unit are the same as those described under Alternative 3. No other changes are expected as a result of a change of grazing season proposed for the South Valley Unit.

No direct effects to golden eagles are expected, although indirect effects are expected as a result of the proposed spring/summer grazing on the South Valley Unit, since it would negatively impact prey species' habitat in a large portion of the allotment. The loss of residual cover, along with physical disturbance by livestock to wildlife or their habitats would negatively impact most prey species important to golden eagles.

Both negative and positive effects to mule deer and elk habitat are expected due to proposed changes in livestock numbers or season of use on the allotment. Grazing the South Valley Unit during the summer period would remove big game and cattle interactions during the winter period, but would allow cattle to remove growing vegetation at a period and frequency that would negatively impact these species. The level of grazing required during this period to facilitate new shrub establishment would also accelerate pinyon/juniper encroachment, thus creating additional competition for shrub and grassland types in the future as tree canopy cover exceeds 45%. Spring grazing would also allow cattle to access areas not currently grazed during the fall/winter period due to snow accumulations. It also allows cattle to compete for early spring and summer regrowth important for all these species.

MIGRATORY BIRD SPECIES

Effects to migratory birds will vary by species as a result of the existing grazing system. Of the shorebirds, such as the American avocet, black-necked stilt, Wilson's phalarope, American white pelican, and long-billed curlew, only the species that nest after June would likely be impacted by possible livestock trampling in the Linwood Unit since early spring grazing would be abolished. Moderate livestock grazing may benefit (NatureServe 2004) or have no effect on species such as the burrowing owl, loggerhead shrike, northern harrier, bobolink, McCown's longspur, short-eared owl, and Swainson's hawk, since these species prefer short pasture-like areas to nest and forage.

Shrub steppe obligate species, and birds with habitats in pinyon-juniper woodlands, such as the Brewer's sparrow, sage sparrow, Virginia's warbler, black-throated gray warbler, pinyon jay, gray vireo, and pygmy nuthatch may be directly affected by Alternative 4 since cattle would be in this the South Valley Unit during the spring nesting season and would also be removing more residual cover.

The removal of residual cover by cattle grazing in the Linwood and South Valley Units may indirectly affect small mammal species, which are the forage base for raptor species such as the prairie falcon and ferruginous hawk. The removal of residual cover such as grasses, weeds, and shrubs would reduce hiding cover for these small mammals. This may indirectly affect prairie falcons and ferruginous hawks positively by reducing the hiding cover for small mammals making it easier to hunt and capture these species. It may ultimately affect these small mammals negatively by reducing the populations due to a lack of forage and hiding cover.

Of the action alternatives considered, Alternative 4 would have the greatest impact on wildlife and wildlife habitats on the allotment. This alternative reduces livestock use levels and associated effects on the Linwood Unit, but results in an overall increase in negative effects to upland grass and shrub cover dependent wildlife species in the South Valley Unit. Further, the level of livestock disturbance needed to result in a corresponding shift in shrub species composition on the allotment may be unattainable due to physical site characteristics. Consequently, attempting to achieve this goal unduly increases the range of negative effects to a large number of wildlife species when compared to the number of species benefiting, if this goal is met.

2. Cumulative Effects – The cumulative effects on wildlife from this alternative are similar to those described for the current condition in Alternative 1. However, of the action alternatives, this alternative is expected to result in the greatest level of negative effects to wildlife species or their habitats when considered at the cumulative effects scale. Because this alternative requires more intensive grazing of the South Valley Unit, this grazing alternative is expected to negatively impact wildlife habitats on approximately 8.5% of the cumulative effects area. The activities previously discussed in the *Past, Present, and Reasonably Foreseeable Activities* section, and more specifically in the Cumulative Effects Section for Alternative 1, would have a minor influence on wildlife use in the surrounding area. However, given the xeric nature of the plant communities on this Unit, as well as the wildlife species known to utilize this area, this alternative would introduce a considerable change in the livestock use currently occurring within the watershed area evaluated.

G. RECREATION

1. ANALYSIS AREA

The area of analysis is the Linwood-South Valley Allotment located on the Flaming Gorge Ranger District and within the boundaries of the Flaming Gorge National Recreation Area. The allotment's interface with the Reservoir varies from flat, sandy beaches to sheer, rocky cliffs.

2. EXISTING CONDITION/AFFECTED ENVIRONMENT

Access to the allotment is limited. Highway 44 from Manila, UT to Greendale Junction is a National Scenic Byway and provides views to a small portion of the allotment. Forest Service Road 537 accesses the Flaming Gorge Reservoir in the Linwood Bay area and serves as an undeveloped boat ramp primarily for local use. One undesignated dirt road heads south from near this boat ramp and provide access to the shoreline. Forest Service Roads 592 and 182 access the allotment near Sheep Creek Bay.

Bordering the allotment on the northwest is Henry's Fork Wetlands Day Use Area. This developed recreation site provides hiking, bird watching, picnicking, and environmental education opportunities.

There are no developed recreation sites within the allotment, however the allotment provides many types of recreation, including dispersed camping, shore fishing, sight seeing, bird-watching, walking, and off-highway vehicle (OHV) use. Off-highway vehicle use occurs primarily on the South Valley Unit.

Recreation Use Trends – Popular recreational activities in the Flaming Gorge Area show an increase of about 7% per year, and this trend is expected to continue for the next few years.

Recreation Opportunity Spectrum (ROS) – The Recreation Opportunity Spectrum (ROS) is a system used to identify and classify National Forest System lands and provides a framework for inventorying, planning, and managing the recreational experience and setting. The ROS includes classes ranging from primitive to urban. The entire Linwood-South Valley Allotment falls within the Roaded Natural category. This class represents a moderate level of development and moderate social interaction within a modified physical setting that is not dominated by evidence of humans. The environment may be modified but would appear natural.

Visual Quality – Overall, the visual resource is a composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for forest visitors.

Landscape Character – The Landscape Character gives a geographic area its visual and cultural image, and consists of the combination of physical, biological, and cultural attributes that make each landscape identifiable or unique. The allotment has a variety of different landscapes that can be grouped into three classifications.

Starting at the north, generally a flat landscape interfaces with beaches and the reservoir. This area is characterized by sagebrush, grasses, and pastureland. Moving south, hills and rock outcrops lead to steep cliffs and very rough terrain. This area represents a transition from the lower elevation sagebrush community to a pinyon/juniper zone. The higher elevations at the southern end of the allotment consist of a pinyon/juniper community.

Scenic Integrity – Scenic Integrity is the degree of intactness or wholeness of the landscape character. For the purpose of this analysis, the Linwood-South Valley Allotment will be addressed, as perceived from major travel routes and boats from the Reservoir.

Due to relatively limited access to most areas within the allotment, the overall wholeness of the landscape character has not been altered to a considerable degree. Views from Highway 44 and the Reservoir depict a rugged landscape with little degradation. On a Scenic Integrity scale of Very High, High, Moderate, Low, or Very Low, the rating for this allotment would rate as High (appears unaltered) or Moderate (slightly altered).

In a National Visitor Use Monitoring Project (NVUMP, USDA Forest Service May, 2002), Forest visitors were asked to rate their satisfaction of several features or issues relating to Forest condition and management (Table 6). The three items of discussion were scenery, condition of the natural environment, and attractiveness of the Forest landscape. As a result of the survey of these three subjects, 82% of all respondents surveyed said the scenery, natural environment, and Forest landscape was “Very Good” and 15% of all respondents said the scenery, natural environment, and Forest Landscape was “Good.” The result of this information indicates a public rating of over 97% for “Good” to “Very Good” scenic condition for the Forest.

Constituent Information – As mentioned above, a NVUMP was completed on the Ashley National Forest in 2001. This project was a visitor survey, which was designed to obtain general information on Forest recreation visitors’ patterns of use, interests, and demographic data. Approximately 25% of all Forest traffic was not recreation oriented. Information gained from the NVUMP is described below.

Roughly half of Forest visitors are from local communities. Approximately one-fourth of the visitors are from the Wasatch Front. The rest come from other places in Utah and other states. Two percent of all visitors come from foreign countries.

According to the NVUMP, there was an average of 2.7 people per vehicle and the average length of stay was 25 hours. Two of five visitors stayed overnight on the Forest. The top five recreation activities on the Forest were viewing natural features, relaxing, viewing wildlife, fishing, and developed camping.

As a part of the NVUMP, Forest users were asked to rank their satisfaction on specific subjects. There were 164 people who voluntarily responded to this survey (Table 6).

Table 6. User satisfaction from a NVUMP visitor survey. Responses are based on a ranking of Poor (P), Fair (F), Average (A), Good (G), and Very Good (VG) of particular features.

FEATURE	Developed Day Use Sites					Developed Overnight Sites					General Forest Areas				
	P (%)	F (%)	A (%)	G (%)	VG (%)	P (%)	F (%)	A (%)	G (%)	VG (%)	P (%)	F (%)	A (%)	G (%)	VG (%)
Scenery	0.0	0.0	0.0	0.0	100	0.0	0.0	0.0	0.7	99.3	0.0	0.4	4.0	27.4	68.2
Condition of the natural environment	0.8	0.0	1.4	13.1	84.7	0.0	0.0	1.9	16.5	81.7	0.6	2.1	19.5	26.7	51.0
Condition of developed recreation facilities	0.0	0.0	5.2	25.7	69.1	0.0	0.0	6.2	36.5	57.3	0.0	1.6	17.5	37.5	43.5
Condition of Forest roads	4.9	2.4	9.0	23.4	60.3	0.0	0.0	3.3	50.7	46.0	2.2	7.2	21.0	36.2	33.5
Condition of Forest trails	0.0	0.0	9.9	61.5	28.6	0.0	0.0	17.9	45.6	36.5	1.8	1.1	19.2	48.1	29.8
Feeling of Safety	0.0	0.6	3.8	42.8	52.8	0.0	0.0	0.9	52.5	46.7	0.0	0.0	2.7	22.7	74.5
Attractiveness of Forest landscape	0.0	0.0	0.0	7.0	93.0	0.0	0.0	0.0	13.3	86.7	0.0	1.8	7.0	17.8	73.4

A spot sample was taken from the Visitor Register at the Flaming Gorge Dam Visitor Center during the timeframe from January 24, 2002 to June 9, 2002. This was a voluntary register at the visitor center desk for people to write their name, city, number in group, and comments. There were 637 respondents to the register and 370 comments, of which all but two were positive

remarks such as “Breathtaking,” “Saw a Moose,” or “Great!” The other two comments expressed concern over not being able to tour the dam, and difficulty in pulling a trailer in the traffic. There were no comments expressing concern over negative scenic features on the Forest.

Visual Quality Objectives (VQOs) – Visual Quality Objectives describe a desired level of excellence based on physical and sociological characteristics of an area and refers to the acceptable degree of alteration of the characteristic landscape. The five classifications are Modification, Maximum Modification, Preservation, Partial Retention, and Retention.

The entire Linwood-South Valley Allotment falls with the Retention category. This management prescription details, in general, that human activities are not evident to the casual forest visitor.

Transportation/Access

Presently there are two dirt roads that provide access onto the peninsula located in the Linwood Unit. Neither road is a Forest system road, but both are currently managed as access routes onto the peninsula. The first road heads south from the Linwood Road near the Linwood boat launch area and continues along the east side of the old Linwood horse pasture existing fence line. The other road is not shown on the map but contours along the edge of the peninsula and provides access to the edge of the reservoir. These two roads are accessed at a junction near the Linwood boat launch area. The junction is in poor condition due to steepness of the road and irrigation water draining off the pastures down this steep section. Vehicles attempting to access this steep section in wet conditions have also contributed to its poor condition.

3. ENVIRONMENTAL CONSEQUENCES (Recreation)

a. Effects Common To All Alternatives

The recreation and visual resources would be effected minimally and enhanced slightly with the actions in all alternatives, especially Alternatives 2, 3, and 4. Continued access to the Linwood boat ramp would be a positive consequence to local users of the area. The visual esthetics would be improved with the treatment of invasive species and removal of obsolete fence structures and the horse shed in the area.

The recreation and visual resources would not be compromised to a degree that is unacceptable in any of the alternatives. In many instances in Alternatives 2, 3, and 4, the recreational and visual experience quality would be improved from the current management situation.

Vehicle access to the roads onto the peninsula south of the Linwood Boat Launch area would be improved. The dirt road that heads south from the Linwood Road near the Linwood boat launch area and continues along the existing fence line on the east side of the old Linwood Horse Pasture would be leveled out at the junction and put on a better grade where it intersects with the Linwood Road. The rest of this road would also be obliterated. Motorized access would still continue along the second existing road that contours primarily along the reservoir’s edge.

b. Alternative 1 - Maintain Current Grazing (No Action Alternative)

1. Direct and Indirect Effects – Under Alternative 1, the potential for conflicts between recreational users and livestock exists in the Linwood Unit, especially north of the Linwood Road at the boat launch site where concentrated recreational use occurs. This potential exists even with grazing occurring generally before Memorial Day and after Labor Day. Evidence of cattle grazing, such as cattle manure, does distract from the recreational experience in concentrated use areas such as the Linwood boat launch site. Elsewhere on the Linwood Unit the potential for conflicts also exists, but it is less since these are dispersed recreational areas with little overnight camping.

The South Valley portion of the allotment receives considerably less recreation use and maintaining the current grazing strategy would not affect the recreation resource in the Unit.

2. Cumulative Effects – There are no cumulative effects from any projects described in *Section A. Past, Present, and Reasonably Foreseeable Activities* that overlap in time and location with the effects of the actions described in Alternative 1. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

c. Alternative 2 – No Grazing

1. Direct and Indirect Effects – The direct and indirect effects of the no grazing alternative would eliminate any potential for conflicts between recreational users and livestock and would have no effect on visual resources in the allotment area. Prohibiting livestock grazing within concentrated recreational use areas such as the Linwood boat launch site would improve the recreational experience. There would also be an increased quality of experience for the dispersed recreationist elsewhere on the allotment. The anticipated removal of interior fences and the Forest Service horse shed would also restore a higher visual quality to the landscape.

2. Cumulative Effects – There are no cumulative effects from any projects described in *Section A. Past, Present, and Reasonably Foreseeable Activities* that overlap in time and location with the effects of the actions described in Alternative 2. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

d. Alternative 3 – Maintain fall grazing on the South Valley Unit as currently managed, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – The proposed action to split the allotment would result in cattle being removed from the Linwood Boat Launch area which receives concentrated recreational use. This would reduce the potential for conflicts between recreationists and livestock, and would be a positive recreational benefit for the four out of five years livestock would be removed from this portion of the allotment. The visual resource would be improved since the only access road into the Linwood area, the Linwood Road, would not have any cattle upon it that would dominate the scenery. The elimination of cattle manure from these sites would also have a positive effect. Additionally, an overall reduction in livestock would also reduce the potential for conflicts elsewhere on the allotment. The construction of an additional 0.5 miles of fence would distract from the naturalness of the area. However, with the removal of existing obsolete fences (~2.4 miles) and the Forest Service horse shed, the naturalness of the area would be

improved. By reducing the AUMs on South Linwood and only allowing North Linwood to be grazed once every five years, the perceived esthetics in the area would be a higher quality experience for users wanting a more natural setting.

The South Valley portion of the allotment receives considerably less recreation use and maintaining the current grazing strategy would not affect the recreation resource in the Unit.

2. Cumulative Effects – There are no cumulative effects from any projects described in *Section A. Past, Present, and Reasonably Foreseeable Activities* on page 21 that overlap in time and location with the effects of the actions described in Alternative 3. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

e. Alternative 4 – Change grazing in the South Valley Unit from fall/winter to spring/summer to maximize browse production, and change grazing numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – Refer to *Section d. Alternative 3* discussion above.

Changing livestock grazing from November 15 through December 15 to spring grazing on the South Valley portion of the allotment would indirectly improve the visual resource of the South Valley Unit when viewed from Highway 44. Since private land immediately adjacent to Highway 44 has spring cattle grazing, additional cattle viewed in the background would not be distracting. However, more recreational use of the South Valley Unit probably occurs in the spring in the form of hiking and motorized travel and sight seeing than in November or December. Consequently, the potential for conflicts between recreational users and livestock would be higher.

2. Cumulative Effects – There are no cumulative effects from any projects described in *Section A. Past, Present, and Reasonably Foreseeable Activities* that overlap in time and location with the effects of the actions described in Alternative 4. These include any past, present, or reasonably foreseeable activities that may occur within the Linwood-South Valley Allotment.

H. HERITAGE

1. ANALYSIS AREA

The analysis area is the Linwood-South Valley Allotment boundary. This area was used to evaluate cumulative effects.

2. EXISTING CONDITION/AFFECTED ENVIRONMENT

Approximately 20% of the allotment has been surveyed for cultural resources under Forest Project # AS-03-0971 and State Project # U-03-FS-0873f. There are 29 sites recorded in the area. Of the 29 sites recorded prior to 2003, 19 of them were determined to be significant (eligible for the National Register of Historic Places). A review of the site records showed that 10 of these significant sites mentioned cattle grazing as an impact.

Five sites were of concern because of the quantity of material and their location. These sites were 42Da536, Da1016, Da1014, Da1015, and Da1006. These sites were investigated to appraise their current condition and determine the extent of cattle and erosion damage by an archaeological technician and an intern. These visits found previous cattle grazing had not adversely impacted the qualities making these sites eligible for the National Register. Site 42Da1014 was the only site that did not show any signs of cattle on or near the site. Site 42Da1015 had the most evidence of cattle. This came in the form of a large amount of cattle fecal material in the rock shelter. The apron where the cultural materials were exposed appears to be untouched.

3. ENVIRONMENTAL CONSEQUENCES (Heritage)

a. Alternative 1 – Maintain Current Grazing (No Action Alternative)

1. Direct and Indirect Effects – Since no clear evidence of negative effects due to current cattle grazing can be documented at sites in this allotment, no change in the risk to cultural resource values are expected by continuing with the existing livestock grazing system. Additional cultural surveys would only be required in response to site-specific modifications to existing range improvements.

2. Cumulative Effects – There are no past, present, or reasonably foreseeable activities that would cumulatively affect cultural resources under Alternative 1 within the Linwood-South Valley Allotment boundary.

b. Alternative 2 – No Grazing

1. Direct and Indirect Effects – This alternative would remove all potential effects to cultural resource values as a result of cattle grazing activities on the allotment. No additional cultural surveys would be required.

2. Cumulative Effects – There are no past, present, or reasonably foreseeable activities that would cumulatively affect cultural resources under Alternative 2 within the Linwood-South Valley Allotment boundary.

c. Alternative 3 – Maintain fall grazing on the South Valley Unit as currently managed, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – Because no clear evidence of negative effects due to current cattle grazing can be documented at sites in this allotment, only a slight decrease in potential risk to cultural resource values is expected as a result of reducing livestock numbers on the Linwood Unit. However, additional cultural surveys would be needed prior to installation of new fences or ditch reconstruction.

2. Cumulative Effects – There are no past, present, or reasonably foreseeable activities that would cumulatively affect cultural resources under Alternative 3 within the Linwood-South Valley Allotment boundary.

d. Alternative 4 – Change grazing in the South Valley Unit from fall/winter to spring/summer to maximize browse production, and change grazing numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – Although no clear evidence of negative effects due to current cattle grazing can be documented at sites on the allotment, a season of use change on the South Valley Unit increases the potential of erosion on the allotment.

As with Alternative 3, additional cultural surveys would be needed prior to installation of new fences, ditch reconstruction, and additional water developments needed to make this alternative functional.

Further, because there are a high percentage of National Register eligible sites, with potential for identifying additional eligible sites, any increased erosion in the South Valley Unit increases the risk to cultural resources. If this alternative is selected, the Ashley National Forest and Utah Division of State History will negotiate a monitoring plan to identify and visit at risk sites to document any changes to their condition. This monitoring plan would specify appropriate mitigation procedures (such as fencing) to reduce any identified effects if conditions deteriorate.

2. Cumulative Effects – Besides the potential for a slight increase in erosion, there are no past, present, or reasonably foreseeable activities that would cumulatively affect cultural resources under Alternative 4 within the Linwood-South Valley Allotment boundary.

I. SOCIO-ECONOMICS

1. ANALYSIS AREA

Daggett County was used as the analysis area to determine the socio-economic effects of livestock grazing on the current Term Grazing Permit holder, also known as the permittee. Cumulative effects were also evaluated using this same analysis area.

2. EXISTING CONDITION

Effects of cattle grazing on fisheries, heritage, vegetation, recreation, soils, hydrology (including water quality), as well as fish and wildlife have been fully disclosed in this chapter under their respective resource using non-monetary values to assess their overall effects. The direct and indirect effects of socio-economic impacts on the permittee are a qualitative assessment. Forest Service Handbook FSH 1909.17.11 direction does not require quantification of all net public benefits. This direction also states “Because some outputs and effects cannot be adequately valued in many planning situations and must be handled using constraints in developing planning alternatives, true measures of economic efficiency often cannot be obtained.”

Currently there is one Term Grazing Permit issued to one permittee on the Linwood-South Valley Allotment. The permittee’s ranch operation is part of a much larger regional ranching and livestock operation that includes both cattle and sheep. Only cattle are grazed on the Linwood-South Valley Allotment. This ranch was operated as a cow-calf operation until early in 2004 when operations were changed to a cattle yearling operation, which would not require winter-feeding at this ranch. The ranch lies within Daggett County near Manila, Utah. The

permittee has depended upon forage from this allotment for a portion of the forage his cattle need throughout the year. Hay had been grown on private or leased lands to feed livestock, or to sell for income.

Daggett County is a small county with a population of less than 1,000. The Town of Manila has a population of 308. Daggett County is a rural county originally settled as a ranching community. Cattle ranching remains an important part of the local culture and economic base, even though recreational services now represent the predominant economic base of the county.

3. ENVIRONMENTAL CONSEQUENCES (Socio-economics)

a. Alternative 1 - Maintain Current Grazing (No Action Alternative)

1. Direct and Indirect Effects – There would be no direct socio-economic effects to the livestock permittee and community associated with this alternative since the current livestock operation (i.e., numbers and season of use) would continue as it is presently being managed. However, there could be indirect socio-economic effects to the permittee associated with this alternative since continuing the same grazing management may result in a decrease of forage and a increase in bare ground on the allotment due to overuse by livestock. If this were to occur, there would likely be a negative economic return to the permittee due to below average calf weights and early off dates. There is no expected economic or cultural loss to the community if this alternative is selected.

2. Cumulative Effects – Under Alternative 1, there are no past, present, or reasonably foreseeable activities that would have cumulative effects on the socio-economic status of the livestock permittee or the community.

b. Alternative 2 – No Grazing

1. Direct and Indirect Effects – Socio-economic effects associated with Alternative 2 would be negative to the local livestock permittee and to the regional operations of this ranch. The current permittee depends on the use of the Linwood-South Valley Allotment to support a portion of his livestock during the months they are permitted to graze. It is probable that with the adoption of Alternative 2, the no grazing alternative there would be less economic revenue to the permittee and without continued operation of the ranch, to the local community as well. While this would have a definite economic effect to the permittee, it is unlikely that the ranch would cease to operate if cattle grazing were discontinued. This permittee may have other options and areas where livestock grazing could continue and/or that local hay production could be emphasized. Assuming that this is the case, it is unlikely that there would be a substantial effect upon the local economy or cultural aspect of the local community.

2. Cumulative Effects – Since there would be no cattle on the allotment under Alternative 2, there would be no past, present, or reasonably foreseeable activities that would cumulatively affect the socio-economic status of the permittee on the Linwood-South Valley Allotment.

c. Alternative 3 – Maintain fall grazing on the South Valley Unit as currently managed, and change cattle numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – A reduction in livestock numbers would require the permittee to find other areas to graze his cattle or reduce numbers. Given that the permittee has already changed their operations from a cow/calf to yearling operation it is uncertain how this change would affect their operations or profits. However, it is likely that there would be an economic loss. Economic and cultural effects to the local community would be unlikely with the continued operation of the ranch. The new 0.5 miles of fencing to be constructed as part of this alternative would require the permittee's 50% participation in its construction.

2. Cumulative Effects – Under Alternative 3, there are no past, present, or reasonably foreseeable activities that would have cumulative effects on the socio-economic status of the livestock permittee on Linwood-South Valley Allotment.

d. Alternative 4 – Change grazing in the South Valley Unit from Fall/Winter to spring/summer to maximize browse production, and change grazing numbers, seasonal use, and boundaries on the Linwood Unit.

1. Direct and Indirect Effects – A reduction in livestock numbers on the Linwood Unit would require the permittee to find other areas to graze his cattle or reduce numbers. Given that the permittee has already changed their operations from a cow calf to a yearling operation it is uncertain how this change would affect their operations or profits. However, it is likely that there would be an economic loss. Economic and social effects to the local community would be unlikely with the continued operation of the ranch. The new 0.5 miles of fencing to be constructed as part of this alternative would require 50% permittee participation in its construction. A change in the grazing season from fall/winter to spring/summer on the South Valley Unit would also affect the permittee's cattle operation and require him to change his operations. It is uncertain whether or not this would result in an economic loss or in an inconvenience since total use would remain the same as Alternative 4. This change would not be expected to result in any economic or cultural loss to the local community.

2. Cumulative Effects – Under Alternative 4, there are no past, present, or reasonably foreseeable activities that would have cumulative effects on the socio-economic status of the livestock permittee on Linwood-South Valley Allotment.

J. ENVIRONMENTAL JUSTICE

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, and Departmental Regulation 5600-2 direct federal agencies to integrate environmental justice considerations into federal programs and activities. Environmental justice means that, to the greatest extent practicable and permitted by law, all populations are provided the opportunity to comment before decisions are rendered on, are allowed to share in the benefits of, are not excluded from, and are not affected in a disproportionately high and adverse manner by, government programs and activities affecting human health or the environment.

This Environmental Assessment is consistent with this Order. The Interdisciplinary Team sought and incorporated public involvement within Daggett County that included the affected permittee, county commissioners and other county citizens. The proposed action and proposed alternatives will not have a discernible effect on minorities, American Indians, or women, or the civil rights of any United States Citizen. Nor will it have a disproportionate adverse impact on minorities or low-income individuals. No civil liberties will be affected. At this time, no minority or low-income communities have been identified within Daggett County (U.S. Bureau of the Census, Census 2000).

Executive Order 12898 also directs agencies to consider patterns of subsistence hunting and fishing when an agency action may affect fish or wildlife. There are no tribes holding treaty rights for hunting and fishing within the project area or cumulative analysis area for the project. Consequently, any decision made will not alter opportunities for subsistence hunting by Native American tribes.

Based on experience with similar projects on the Flaming Gorge Ranger District, none of the alternatives would substantially affect minority or low-income individuals, women, or civil rights. The implementation of this project is expected to continue to provide job opportunities in Manila, Utah. Some of these communities include minority populations that may benefit from the economic effects (U.S. Bureau of the Census, Census 2000).

CHAPTER 4 – CONSULTATION AND COORDINATION

The Forest Service consulted the following individuals, Federal, State, and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

U.S. Fish and Wildlife Service, Utah Field Office
Utah Division of Wildlife Resources, Eastern Region
U.S. Forest Service, Vernal District Office

The Forest Service assembled an interdisciplinary team (IDT) of resource specialists that coordinated the completion of this EA. Personnel involved, their responsibilities, and qualifications are provided below.

Ashley National Forest IDT Members

D. Ross Catron, Ecosystem Management Group Leader

Education: B.S. Range Science
Project Responsibility: Interdisciplinary Team Leader
Experience: 25 years U.S.D.A. Forest Service

Amy Barker, Writer Editor

Education: B.S. Forestry
Project Responsibility: NEPA, Writer Editor
Experience: 5 years U.S.D.A. Forest Service

Oscar Martinez, Wildlife Biologist

Education: B.S. Wildlife Biology
Project Responsibility: Wildlife
Experience: 4 years U.S.D.I. Bureau of Land Management
11 years U.S.D.A. Forest Service

Robert Christensen, Wildlife Biologist

Education: B.S. Fisheries and Wildlife Management
Project Responsibility: Wildlife (MIS)
Experience: 2 years Utah Division of Wildlife Resources
5 years U.S.D.A. Forest Service

Brett Thompson, Fisheries Biologist

Education: B.S. Fisheries & Wildlife Management
M.S. Fisheries Biology
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Experience: 4 years U.S.D.A. Forest Service

Joe Brinton, Hydrologist

Education: B.S. Engineering Geology
M.S. Structural Geology

Project Responsibility: Hydrology, watershed, water quality
Experience: 2 years U.S.D.I. U.S. Geological Survey
1 year U.S.D.A. Forest Service

John Campbell, Recreation Program Manager

Education: B.S. Forest Resources
Project Responsibility: Recreation
Experience: 3 years U.S.D.A. Forest Service

Sherel Goodrich, Ecologist

Education: B.S. Range Management
M.S. Plant Taxonomy
Project Responsibility: Plant Communities
Experience: 31 years U.S.D.A. Forest Service

Dustin Bambrough, Rangeland Management Specialist

Education: B.S. Wildlife and Range Resources
M.S. Wildlife and Range Resources
Project Responsibility: Grazing Management
Experience: 3 years U.S.D.A. Forest Service

Christy Oprandy, Soil

Education: B.S. Merchandizing
Partial credits for B.S. Soils
Project Responsibility: Soils
Experience: 14 years U.S.D.A. Forest Service

Byron Loosle, Archeologist

Education: B.S. Anthropology
M.S. Anthropology
PhD Anthropology
Project Responsibility: Heritage, cultural resources, archeology
Experience: 12 years U.S.D.A. Forest Service

APPENDIX A – MAPS

MAP 1. Linwood-South Valley Allotment and Henry's Fork-Flaming Gorge Watershed Boundary.

MAP 2. Linwood-South Valley Allotment.

MAP 3. Map of Alternative 1 displaying the existing fences and proposed changes on the Linwood Unit.

MAP 4. Map of Alternative 2 displaying the proposed changes on the Linwood Unit.

MAP 5. Map of Alternatives 3 and 4 displaying the proposed changes on the Linwood Unit.

MAP 6. Map of Alternatives 1, 2, 3, and 4 displaying the Unit boundary and existing fences on the South Valley Unit.

MAP 7. Ecological units on the Linwood-South Valley Allotment as defined by the Land Systems Inventory.

APPENDIX B – SUMMARY OF RANGE STUDIES

Summaries for range studies located on the Linwood-South Valley Allotment are provided below. Information includes study names, associated ecological unit(s), cultural practices and other history, ungulate uses, years the study sites were visited, and the current vegetative trends and conditions at the study sites. Alternatives discussed within this document were influenced by data summarized in these range studies.

Study 4-1E and W

This study provides a contrast of permitted livestock grazing (east of a fence) and absence of livestock for many years (west of a fence).

Plant Taxa and Years	Crown Cover East	Crown Cover West	Nested Frequency Value – East	Nested Frequency Value – West
Winterfat 1989	1.5%	2.7%	91%	58%
Winterfat 1997	1.5%	5.7%	--	--
Wyoming big sagebrush 1989	6.9%	6.4%	62%	79%
Wyoming big sagebrush 1997	9.1%	7.7%	--	--
Needle-and-Thread grass 1989	--	--	307%	269%
Thickspike wheatgrass 1989	--	--	303%	296%
Sandberg bluegrass 1989	--	--	178%	83%
Geyer larkspur 1989	--	--	131%	84%
Ground cover (%) 1989	58%	69%	--	--

Data for the site shown in the above table shows percent crown cover of winterfat lower on the side grazed by livestock but the frequency of winterfat is higher on the side grazed by livestock. It also shows winterfat increasing over time on the side not grazed by livestock and remaining static on the side grazed by livestock.

Sagebrush cover appears to be slightly greater on the side grazed by livestock. Frequency of sagebrush is slightly less on the side grazed by livestock but the difference is not significant.

Frequency of perennial grasses is greater for all species on the side grazed by livestock. Vigor of these grasses might be expected to be somewhat lower on the side grazed by livestock. However, frequency data indicates perennial grasses are being maintained at high levels on the site. Vigor could likely be restored with one or two seasons of rest.

Geyer larkspur (native, perennial forb) was considerably more frequent on the side grazed by livestock. Ground cover east of the fence is 84% of what it is on the west side of the fence.

This study indicates plants of moderate to high value for watershed protection are being maintained concurrent with livestock grazing. The reduced cover of winterfat is somewhat offset by the higher frequency of this plant and the higher frequency of perennial grasses. The somewhat high percent crown cover of sagebrush might compensate somewhat for lower crown cover of winterfat as winter browse for wild ungulates. The principal indicator of need to reduce

or at least not increase use of livestock at this site is the difference in ground cover. The value of 84% below the apparent potential for the site is just below the threshold of desired ground cover.

Study 4-21

This study is within ecological unit NF90 but outside the allotment. This study shows typical conditions for this unit in an area closed to livestock since the early 1960s.

Study 4-24&B

This fenceline contrast indicates native perennial grasses and sagebrush are being maintained with high vigor concurrent with livestock grazing. It also shows low to moderate capacity of Utah juniper to displace Wyoming big sagebrush/grass communities.

Study 4-24D

Penstemon acaulis (PEAC3) was collected from “Wildcat Basin” in 1973. This site was visited again to find and monitor this plant. The great majority of the plants of PEAC3 were found growing in an old two-track road as was the case in 1973 and the remainder of the plants were found in close proximity to the road. The area of juniper above the road and the area of big sagebrush below the road were searched for the plant. It was not found in either of those areas. This and other surveys and monitoring work at other sites (Study 3-26) strongly indicate PEAC3 is adapted to moderate disturbance, and in some cases it appears to be dependent on disturbance. It appears likely the plant would not be present in Wildcat base if it were not for the occasionally used two-track road.

Study 4-25

This fenceline contrast indicates native perennial grasses are being maintained concurrent with livestock grazing. It also indicates Utah juniper is slowing, displacing a Wyoming big sagebrush/needle-and-thread grass community.

Study 4-26

This study indicates native perennial graminoids are being maintained in a Wyoming big sagebrush community concurrent with livestock grazing. Without fire or other treatment, pinyon/juniper can be expected to displace this small sagebrush/grass opening.

Studies 4-33

This study demonstrates the opportunity for rapid improvement in greenline vegetation with light vegetation.

Studies 4-34A, 4-34A2, 4-34A3, and 4-34B

These studies show rapid recovery of greenline vegetation with one season of rest from livestock where there is potential for recovery. On cut banks of Mancos Shale the banks are relatively barren. This is expected for this substrate.

Study 4-35

This shows recovery of greenline vegetation of high vigor before livestock grazing of the current season, but with a long history of past grazing. High vigor of greenline vegetation appears to

have been maintained concurrent with livestock grazing. Species of high value for stream bank stability dominate the streamside.

Studies 4-41A and B

Wyoming big sagebrush and native, perennial graminoids dominate these sites. This is concurrent with a long history of livestock use. Ground cover appears to be sufficient to protect the site. However, potential for ground cover appears to be less on the ecological unit on which this is located in comparison with Wyoming big sagebrush/grass communities on some other ecological units.

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